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THE

VETERINARIAN;

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FOR 1868.

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EDITED BY

PROFESSOR SIMONDS,

ASSISTED BY

PROFESSORS VARNELL, TUSON, & BROWN.

Ars Veterinaria post medicinam secunda est.—*Vegetius.*

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THE

VETERINARIAN.

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Communications and Cases.

VETERINARY MEDICAL ASSOCIATION CONVERSAZIONE.

A MEETING from which we anticipate most important results was held by the council and members of the Veterinary Medical Association, on Monday, December 16th, for the purpose of inaugurating the introduction of the microscopes and apparatus for minute investigation which have been purchased for the use of the association.

Nearly the whole class of students attended the meeting, which was supported by the Principal and Professors of the Royal Veterinary College, and in addition by influential members of the medical and veterinary professions. Among the visitors were Dr. Steele, of Guy's Hospital, the President of the Royal College of Veterinary Surgeons; W. Field, Esq., John Field, Esq., C. Lowe, Esq., J. Woodger, Esq., F. T. Stanley, Esq., J. R. Cox, Esq., H. Batt, Esq.

The President of the Society, Professor Simonds, in opening the proceedings, adverted to the object of the meeting, and stated that as Professor Brown had kindly promised to give a demonstration upon the subject of the use of the microscope, he would therefore content himself with requesting that gentleman to explain the construction of the instrument, and the manner of its employment.

Professor Brown then addressed the meeting, and in the course of his observations dwelt upon the importance of

microscopic inquiry to veterinary science, which offers so rich a field for investigation; he next explained the construction of the microscope, both simple and compound, and afterwards proceeded to demonstrate the process of preparing specimens for examination, and pointed out the manner of focussing the instrument and arranging the light, concluding by urging upon the meeting the desirability of becoming familiar with the methods of manipulating the microscope during the time of their pupilage, when opportunities were afforded them to acquire the elements of sciences which may be advantageously pursued in the future.

Besides the microscopes belonging to the association, a large number of instruments and preparations were furnished by Mr. Collins, and also by Mr. Heath, and much interest was evinced in the various forms of microscopes, and the many very beautiful preparations which were exhibited. The meeting was altogether so successful that we hope we shall be called upon to assist at many such gatherings, which cannot but tend to the advancement of the profession, by cultivating a taste for the higher branches of the veterinary art, and stimulating a desire for those minute investigations which may now be pursued with so much less expenditure of time and trouble than were formerly required, in consequence of the imperfect means of observation which were then at hand.

POPULAR ERRORS CONNECTED WITH VETERINARY MEDICINE.

By W. Ernes, M.R.C.V.S., London.

One of the most serious of the popular errors connected with Veterinary Medicine is that of preventing a horse from lying down when suffering from an attack of colic. This is done from a mistaken notion that by allowing him to do so and to roll he might twist his intestines, but it remains to be proved that this does not occur in horses which have not lain down, or even before they have attempted to lie down. The late Mr. E. Braby put this to the test many years ago. A horse was brought to his infirmary suffering from colic. The driver had carefully prevented the animal from lying down, and was walking it about hurriedly with the same view. Mr. Braby, acting under the same idea, ordered the horse to be

put in the treviss, where under proper treatment he was allowed to remain until he died, when, strange to say, at the autopsy, a twisted gut was found to have been the cause of death. The great anxiety evinced by the suffering animal to lie down shows the relief given by the recumbent position. There is, moreover, always in these cases, a tendency for lying on the back, which may, in my opinion, tend rather to facilitate the untwisting of the gut, and taking advantage of this, I have endeavoured to fix the animal in that position by means of ropes attached to the feet and the beams, or by trusses of straw placed against the sides, and I flatter myself I have by that saved a few cases, the diagnosis of which was unmistakably that of intussusception, or twisted gut.

Another error is cutting out the lampas, as it is vulgarly called, which is usually done with a red-hot iron. Young horses, in which the incisors, as a rule, are short, and in consequence the palate prominent, are said to have the lampas as soon as they evince a loss of appetite, and if a sensible practitioner refuses to cut or burn them, the horse is taken to a farrier, who is always ready with his hot iron to perform this useless and cruel operation, which needs no comment of mine to show the absurdity of.

Another great abuse is that of diuretics, which are constantly administered, either in the shape of balls, or nitrate of potass in the animals' food. Being sedatives they weaken the animal, and moreover they not unfrequently bring on disease of the kidneys. A horse in usual health requires no medicine of any kind, and all balls, whether cordial, cough, condition, or alterative, are to be condemned, as they only tend to fill the pockets of the coachman, groom, and apothecary. Further, serious injury has often been caused by the administration of balls. The resistance offered by the horse when in good health is very great, and if the tongue is forcibly held, it has sometimes been pulled clean out; at others it has been so injured that amputation of the organ has become necessary. A short time ago I had a case where the tongue had been forcibly pulled by a farrier while the animal reared in resistance; mortification being imminent I had to cut off two thirds of it. The horse recovered, and fortunately did very well afterwards.

The periodical bleeding and balling of horses in vogue a quarter of a century ago, is now honoured more in the breach than the observance.

Firing, to strengthen the limbs in race horses and hunters, so much in repute with trainers, hunting and stud grooms,

has fortunately for the poor animals gone out of fashion, and the natural bandage, as it was designated, is dispensed with. Firing is at best but a very questionable remedy, and has long since been discarded from humane practice.

It is a mistake to give medicine in the shape of balls to neat cattle, as from their shape and specific gravity they will fall into the rumen, where they remain inert until returned to the mouth in the act of rumination, when they are rejected by the animal on account of their unpleasant taste.

Worming of dogs is another absurd and cruel operation, the supposed worm being part of the ligament under the tongue which enables the dog to lap. It is possible that the dog for a time, while the tongue is sore from the operation, may desist from gnawing objects, but as this disposition in young dogs is from the effects of dentition, they will begin it again when the soreness of the tongue has passed off.

With this we may class another absurd practice—the removal of the horny pellicle at the end of the tongue of fowls, to cure the so-called "pip." The swelling of the tongue is only the symptom of an internal affection, which cannot be cured by this stupid operation. We can only regret that the maladies to which fowls are subject are not more studied, as the rearing of poultry becomes daily of more importance, and might be made one of the most lucrative branches of rural economy.

I have not alluded to the nicking of horses' tails, and the cropping of dogs' ears and tails. The former, fortunately, is now almost forgotten, and the latter being vivisection with a vengeance, ought to be taken notice of by the "Society for the Prevention of Cruelty to Animals."

OBSERVATIONS ON "SOUNDNESS."

By R. H. Dyer, M.R.C.V.S., Plymouth.

(*Continued from* p. 139, vol. xl.)

Having taken what may be considered to be a sufficient view of the exterior of the subject under examination, it is now high time that we set him in motion.

In treating of the various affections met with in the limbs, which are likely to produce lameness, I may not have altogether exhausted the subject. I am sure I need not caution the examiner that the groom should run the horse very slowly, and with a long and loose rein; just the opposite to what the horsedealer's man would do, if he were selling an

animal. Very few men, unless they have had long training in this particular art, will earry out the intention of the examiner as to soundness. I know of no other thing in connection with this branch of our profession more perplexing than this. The animal under examination, is now permitted to trot gently, a distanee of some fifty yards, more or less. The examiner should, if possible, have made up his mind previous to the animal leaving the stable, or yard, whether to expeet lameness or not. This, if properly attended to, will very mueh assist him in his investigation. Should any irregularity of gait manifest itself, it is at once said the animal is *lame*. This may be true or otherwise. It will, I think, be admitted on all hands, that horses, when allowed their freedom, will travel in their natural manner; that is to say, they will travel so as to favor any infirmity they may have at the time. It must not be lost sight of, that the instinet of all animals is so great, that, if any disease be present in any portion of the limbs (and is suffieient to produee lameness during the progressive movements of the animal), we may rely upon it that that animal is in pain, not only during those movements, but *continually*, as well when at rest as when in motion.

There may be a difference of opinion about this; but I fee assured, every one, after proper and mature refleetion, must eome to the same conclusion. This statement opens up a most important question in reference to the evidence given by witnesses in proseeutions instituted by the "Society for the Prevention of Cruelty to Animals." It is sometimes asked of a veterinary witness, if sueh and sueh an animal (described as being exeessively lame) suffers any pain? Some will answer in the negative! Is it possible there can be two opinions upon sueh a question? If so, allow me to ask, what is lameness? One person will argue that lameness is a peeuliar aetion of a limb produeed by disease, and so on. I am desirous of bringing this question before the members of our eommon profession in order that it may be settled at onee. The only true definition of lameness is, that the animal suffers pain when in motion; or, in other words, "lameness" and "pain" are synonymous terms. I do not hesitate to assert, that, if an animal is lame when walked or trotted, that that lameness or pain is present also *while the animal is at rest;* only in a mueh less degree. It is a difference of degree only. An animal to show pain during a slow walk must suffer indeed, and, it may be taken for granted that as the paee is inereased, *as a general rule*, the pain or lameness is diminished, simply because there is less time for

observation. Most of us have seen "groggy horses," as they have been termed, on coming out of their stalls in the morning. Can it be said these animals were without suffering when at rest? Would one not imagine that the constant shifting of the feet were indications of acute pain? This is, I think, generally understood. One thought will often lead us to greater reflection. In almost all these cases the animal's *gait* or action improves as he goes on.

Having satisfied ourselves that no lameness is present, it becomes necessary to test the animal's soundness as to his wind. By this trial we are anxious to learn if the respiratory apparatus, and, the circulation of blood, are normal, or, in order. We also have the means of gaining some information as to the state of the limbs, but the main object is to test the *wind*. There are various means had recourse to by examiners as to soundness in order to satisfy themselves upon this point. One will merely canter the horse a few yards in his stable yard; another, not having convenient premises, has recourse to the road; while a third is not satisfied without taking the animal into a field. Much of this may depend upon the *class* of animal under consideration.

I have heard it said that some metropolitans are more in favour of a few yards in their own establishments, than they are of the space obtained in a field. They not only prefer the former, but aver that it is far superior for the purpose of testing an animal's wind. I am, however, somewhat sceptical upon this point.

I have examined horses whose impetuosity was so great that they required to go a distance before they would settle down, and during the time they were fretting they would "pull double" and "make a noise." I have also reason to know that many such animals are rejected as "whistlers" and "roarers," when a little more care on the part of the examiner, and a little more space, would have caused him to come to other conclusions.

(*To be continued.*)

THE VETERINARY CHARTER.

By George Fleming, M.R.C.V.S.

Gentlemen,—I much regret that three months' absence in Syria on a special duty connected with the Abyssinian expe-

dition, has prevented my seeing the more recent numbers of your valuable journal.

I trust, however, that it is not yet too late to ask your permission to allow me a brief space to reply to a portion of Professor Dalzell's argument in favour of a veterinary charter for Scotland, which appeared in your issue for November. Those members of the veterinary profession who have its welfare at heart, who best know its history, and the character and position of the men who are exerting themselves to obtain another charter (for which, I contend, there is not the least need), will be best able to estimate the value of the doctor's remarks.

I only now desire to refer to that part of his address in which he goes out of his way to notice me, and to comment on so much of my letter in the September number of the *Veterinarian* as he thought applied to himself.

It must have been a matter of surprise to those members of the profession who were present when Dr. Dalzell delivered his address, and who had perused my paper on the subject of the proposed charter, to find that gentleman claiming for himself certain attributes I have ascribed to a writer in a Scotch newspaper, but whose name I did not think it necessary to disclose. Professor Dalzell's name was not once mentioned by me; and if the remarks I made, and which were founded on fact, are discovered by him to be applicable to himself, he is at perfect liberty to attempt to disprove them or to admit them to be correct, as I believe them to be.

Those of your readers who have read the letters in the Scotch newspaper referred to, the comments supposed to be written by the editor of an agricultural journal, and which were quoted in my previous communication, and this address of Dr. Dalzell, will, perhaps, be able to perceive a strange, but, it may be, accidental likeness. I do not mean to say they were all composed by the same individual; for, though only a portion of the argument employed in Scotland for a separate charter is retained in the address, yet there is a sameness of style, and a unanimity of sentiment, which unmistakably shows how remarkably alike the advocates are in argument and disposition. One or two remarks in the doctor's address referring to me are incorrect in point of fact, but this is a matter of no great moment.

I have no desire whatever to insult any one in connection with this most unwise and, for the veterinary profession, damaging application for another charter. So long as its apologists care for the truth, value facts, and do not resort to fiction, and do not introduce personalities, I am quite

content to look on at their attempts, satisfied that but little harm will ensue to the profession. Certain I am, however, that its interests can never be safe when in the hands of men who, having availed themselves of the privilege of becoming members of the Royal College of Veterinary Surgeons, suddenly discover that the body corporate is a sham, has never done any good, and is incapable of effecting any, and that veterinary surgeons in England are the deadly enemies of their brethren in Scotland. Such mistaken statements I deem it the duty of every true friend of the profession to expose and contradict.

If the question of a separate charter for Scotland were left to be decided by the whole of the members of our profession in the three kingdoms, but little time would be lost in condemning the conduct of the few who agitate in its favour; and who should remember that they have done nothing to aid the Royal College of Veterinary Surgeons, or to raise it to a higher position, though there was nothing whatever to prevent their doing so.

It would be a relief could we get the opinion of some disinterested friend to the movement for a Scotch charter. Such an opinion has not yet been given, for I must confess myself to be as little satisfied with that given by Professor Dalzell as by those advanced in the *Scotsman* newspaper, and also in the pages of the *North British Agriculturist*, and I have no doubt whatever but the majority of your readers will share this feeling.

The most sincere and impartial friend to veterinary science in Britain must hope that this charter will not be granted; for with such a feeling existing as now actuates some of its advocates, I can see nothing in the future should it be obtained but competition, jealousy, ungenerous words and deeds, and everything calculated to make us lament the hour when Professor Dick died.

I beg to remain, Gentlemen,

Yours faithfully.

To the Editors of the 'Veterinarian.'

COMMUNICATION FROM MR. A. OWLES, V.S., SIXTH DRAGOONS, TO MR. GARRATT.

Gentlemen,—Will you kindly allow me to thank Mr. Garratt for his letter? But as he evidently fails to catch my meaning and also misquoted my words, I wish briefly to

revert to the subject, to correct mistakes; the more so because I believe Mr. Garratt does not recognise a "conservative" principle in preparing the foot of the horse for shoeing, which it is my desire to advocate. But before doing so, let me say a word about Mr. Garratt's reason for believing in the expansion of the foot. He says, "we all know that the foot may be bound by the nails in shoeing, and the animal not evince any pain at the time, but when put to work goes lame." It does not appear to me so very extraordinary, that a horse with his shoe drawn on tight, so as slightly to pinch the sensitive foot, should, when the concussion of work is added to the compression from the shoe, evince greater pain than he did at the *time* the shoe was being nailed on, even without the obsolete bugbear of expansion at the inferior surface of the wall; just as another horse when pricked may not evince any pain for several days, till irritation goes on to inflammation, &c.

Mr. Garratt thinks "that when the weight comes on the foot, the frog, bars, and sole, all descend." The bars being attached to a projection of bone (coffin), which bone is also attached on the other side to the wall, it follows, that if the bars descend, so must the wall, unless there be some opposing force. But Mr. Garratt speaks of the wall yielding in another direction; thus he gives two forces acting in contrary directions upon the unyielding wing of the coffin bone at the same time. This is not like nature. There are many reasons besides guarding against pricking, why care should be exercised in placing the nails: they are so many wedges, and liable to injure the sensitive parts and split the wall, but certainly not to prevent expansion.

Mr. Garratt is good enough to say that he agrees with me as to the necessity of having strong shoes for weight-carrying horses; but as I neither gave, nor implied, any opinion respecting horses' shoes whatever, I cannot perceive the grounds for his agreement. Perhaps Mr. Garratt misinterpreted my allusion to "strong soled *boots*" into my advocating strong shoes for horses; whereas it was evident from the context I did so, simply to show that strong soled feet in horses did not increase concussion as Mr. Garratt appeared to think was the case; but, on the contrary, such strong soles, bars, &c. resisted concussion. Mr. Garratt misquotes me when he makes me say "nature rarely allows the *feet* to grow too strong;" and consequently his reasoning about the effects of stabling, diet, &c., falls to the ground, because it so happens that such causes do not prevent the process of nature to which I alluded in writing, "nature does not allow

the SOLE (not feet) to grow too strong, she gets rid of it by exfoliation as required." It is only those who allow nature to protect the sensitive foot, by refraining from mutilating the sole and frog with the drawing knife, who can appreciate how beautifully nature does get rid of the superfluous sole (stabling and diet notwithstanding), and how entirely she supersedes the necessity for all artificial stopping, by retaining the natural moisture of the sole in feet so treated. It would not be easy for such feet to be bound in shoeing. But I suspect these are effects as yet unknown to Mr. Garratt.

I do not think the mere fact that some officers at out quarters (they certainly do not generally) prefer having their horses shod at a private forge, establishes a case against any system. We all know that people like to have their prejudices respected, however absurd they may be, even to the extent of thinning the sole till it yields to the pressure of the thumb, and of opening the heels (so called) with the drawing knife. A man likes to give directions about the shoeing of his own horse; therefore, without wishing to detract from the claims of those forges which enjoy an exceptional reputation, I do not think Mr. Garratt's "strongest comments" any argument with the initiated.

Hoping the consideration of this subject may tend to benefit our patients, by giving them more horn between the stones on which they travel and the sensitive sole,

I remain, Gentlemen,

Yours faithfully.

To the Editors of the 'Veterinarian.'

REPLY TO M.R.C.V.S.

By W. ROBERTSON, M.R.C.V.S., Member of the Scottish Section of the Court of Examiners of the Royal College of Veterinary Surgeons, Kelso.

GENTLEMEN,—In this month's issue of the *Veterinarian* (December), there is a communication from one subscribing himself M.R.C.V.S., relative to the proposed Veterinary Charter for Scotland.

Respecting the nature of this charter or the advantages expected to be derived from it by its promoters, I will not offer an opinion, further than by stating that I have all along been of that number who not only did not consider that a separate charter for the profession in Scotland was absolutely necessary, but that at the present it was undesirable; even

considering that the present body corporate, the Royal College of Veterinary Surgeons, was amply sufficient for and adequate to a much more advanced state of Veterinary Medicine than we have as yet attained to.

Still, while holding this opinion, I have also been of the belief that did the veterinary practitioners, or the patrons of veterinary medicine in Scotland, emphatically demand a separate charter of incorporation, they had a perfect right to its obtainment, however much I, or others with me, might differ in opinion from them as to the expediency in present circumstances of their asserting this right.

It is not with regard to the views entertained by M.R.C.V.S. respecting either the nature of the proposed charter, or what it will virtually accomplish for the profession that I have any fault to find. My special object in now addressing you is to call the attention of the writer of the article referred to, to that part of his communication where, after remarking that had it not been for such substantialities as buildings and endowments in connection with the school in Clyde Street, he goes on to say, "the Veterinary profession in Scotland would have struggled on as it has up to the present time unheeded and despised, and its members looked upon with the usual disgust as dissolute and unworthy of ordinary attention." Such is the opinion expressed by one member of the profession regarding a considerable number of his professional brethren. An assertion more gratuitously calumnious as made by one man regarding any number of his fellows, it has seldom if ever before been my lot to meet with; while from my opportunities of acquaintanceship—opportunities both ample and special—with veterinary surgeons in Scotland, as well as in England, I have no hesitation in asserting that against no greater proportionate number of these in the former than in the latter country can such an accusation with justice be brought. And as one of that considerable section of his professional brethren whom he stigmatises as being "looked upon with the usual disgust as dissolute and unworthy of ordinary attention," I most respectfully yet firmly request that he will furnish me with the data or authority upon which he grounds such sweeping denunciations. Nor can I doubt but that after a reperusal of what he has written, he will see cause to avow that these sentiments were no less unwarranted than uncharitable.

I am, Gentlemen, yours, &c.

PROFESSOR M'CALL, VETERINARY COLLEGE, GLASGOW, TO ALEXANDER ROBERTSON, ESQ., M.R.C.V.S. (OF KELSO), EDINBURGH VETERINARY COLLEGE, CLYDE STREET, EDINBURGH.

[*Copy Letter.*]

Glasgow Veterinary College;
26*th Nov.*, 1867.

Dear Sir,—I am in receipt of your circular calling a meeting of veterinary surgeons of Scotland, to be held in Edinburgh, on Wednesday the 27th instant, for the purpose of considering the expediency of possessing a Scotch Veterinary Charter; and as I cannot be present, and am much interested in the question to be brought before the meeting, I should like you to lay before it my views relative thereto.

I have the opinion that in the meantime the present movement is uncalled for and unnecessary; and, even if it were the reverse of both, that the shape which it is proposed the Charter should take, is most unfair to all veterinary colleges presently existing, or which may afterwards be instituted, except Edinburgh Veterinary College.

The last movement of a similar kind and the present are simply meant to extend the powers of the Edinburgh Veterinary College, and are not, to my mind, intended to develop a veterinary licensing college for Scotland; and this will be seen, I think, by the unfair preponderance given to Edinburgh Veterinary College in the appointment of trustees, both as regards parties resident in Edinburgh, and trustees under the Charter, who are also interested in or connected with the Edinburgh Veterinary College. Indeed, Mr. Finlay Dun, V.S., Weston Park, Shipston-on-Stour, plainly indicated that this was the case as regards the last movement. He said—"You must consider that in making these alterations in the draft Charter, we run considerable risk of weakening the interest felt in it by the public bodies in Edinburgh, but trust that in compensation for this, the alteration will evoke in our favour the unqualified support of the West of Scotland;" and a perusal of the present draft Charter will convince every one willing to be convinced that the object is still the same.

I had thought that my views in regard to the matter of fairness of representation for all schools had been conceded, and that it would have been unnecessary to have dealt with

the question again. In 1866, when Mr. Stevenson, editor of the *North British Agriculturist*, and Mr. Finlay Dun, originated a similar movement, I had certain negotiations with them. Considering the position I stood in relative to the movement, I should have been about the first party to have been consulted regarding it. The reverse was the case. I never was consulted in the matter, and it was not until after a printed document, entitled—"Statement submitted to the Lord Advocate in reference to the obtaining of a Charter for the bestowing of a veterinary diploma for Scotland"—had been presented to his Lordship that I was made aware of the step. In this statement twenty-nine trustees are named—viz., the Right Honorable the Lord Provost and two magistrates of Edinburgh; the Lord Provost and two magistrates of Glasgow; four members of the Senatus Academicus of the University of Edinburgh; the president and two of the council of the Royal College of Physicians, and the president and two of the council of the Royal College of Surgeons; the principal of the Edinburgh Veterinary College; the principal of the Glasgow Veterinary College; the principal of any other veterinary college which may be established in Scotland under Her Majesty's letters patent; and the Lord Provost or chief magistrate of any city or town in which such college shall be situated; five veterinary surgeons to be named in the Charter—namely, Col. F. W. J. Fitzwigram, 15th Hussars, Aldershot; Thomas A. Dollar, New Bond Street, London; Finlay Dun, Weston Park, Warwickshire; Thomas Marshall, Glasgow; Thomas Strangeways, Veterinary College, Edinburgh; the president and two directors of the Highland and Agricultural Society of Scotland; the president and two vice-presidents of the Chamber of Agriculture and Scottish Farmers' Club. And of this number, twenty-five were either located in Edinburgh, or directly interested in the Edinburgh Veterinary College, and the remaining four were the Lord Provost and two of the magistrates of Glasgow, and myself. After obtaining a copy of this document I placed myself in opposition to the granting of a Charter in the terms proposed by it; and the memorialists, finding their position untenable, and the general feeling against their views, ultimately agreed to my suggestions, which were, that the following gentlemen should be added to the number of trustees—viz., two members of the Senatus Academicus of the University of Glasgow, two members of the Senatus Academicus of the University of Aberdeen, two members of the Senatus Academicus of the University of St. Andrews, the president and three of the council

of the faculty of physicians and surgeons, Glasgow; and, as a substitute for Professor Strangeways (being a lecturer in the Edinburgh Veterinary College), Mr. Robinson, Greenock.

After these alterations had been agreed to, I thought the matter concluded. But early in June last I learned that the Highland and Agricultural Society of Scotland had taken up the matter of a Charter for Scotland. In order to make certain of the exact position of matters, I took the liberty of writing Mr. Menzies, their secretary, and the following is a copy of the letter received by me in answer:—"3, George IV Bridge, Edinburgh, 13th June, 1867. Dear Sir,—I have not any heads of Charter for Veterinary College by me, as only a few were printed for the use of the directors; but, as the types were kept up, I am getting a copy printed for you, which I will send by book post to-day or to-morrow. I have been absent in Glasgow for two days, hence the delay in answering your letter. I am, &c., (signed) F. N. Menzies. Jas. M'Call, Esq., principal of Glasgow Vet. Coll." Immediately on receipt of the heads of the Charter, I found that no effect had been given to the arrangement previously made with me, and I therefore asked our town-clerk, Mr. Monro, to communicate with Mr. Menzies on the subject. Mr. Menzies informed Mr. Monro that the former memorialists had no authority for what they had done, and the Highland Society did not feel themselves bound to implement any arrangement made by Mr. Stevenson and others.

I do not wish to make remarks as to the repudiation by Mr. Menzies of the arrangement between Messrs. Stevenson and Dun and me. I think it may fairly be presumed that Mr. Stevenson and Mr. Dun had as much authority for doing as they did as the Highland Society, or rather that neither of them had any authority whatever for promoting any such movement.

At a meeting between Mr. Menzies and Mr. Monro, the former consented to certain concessions being made as to the trusteeship, but subsequently withdrew these, because the Highland and Agricultural Society "had arranged the trustees along with other parties in Edinburgh," and he said, "they might think it strange that the Highland Society made alterations in a matter that did not concern themselves."

Be that as it may, I complain that Mr. Menzies first agreed to make alterations, and thereafter refused to do so; and that if other parties required to be consulted as to the proposed alterations, he should have taken their opinion relative to the alterations before refusing to give effect to them,

and not occasion further trouble if it could be avoided; as he has not seen fit to do either, I have thought proper to lay the foregoing narrative of my position relative to the previous and present movement before my professional brethren, and to give them my views regarding the expediency of possessing a Charter for Scotland, and regarding the proposed Charter, which I shall now proceed to do.

Previous to 1845 I should have considered a movement for getting a Charter for Scotland almost unobjectionable; and since then I might have taken the same view, had the Charter obtained in 1845 been applicable solely to England or to Ireland, or been inefficient in its workings in, or unjust to, Scotland. But these are not the facts. The Charter of the Royal College of Veterinary Surgeons is a Charter applicable to the United Kingdom of Great Britain and Ireland—was obtained on the application of the late *Professor Dick of Edinburgh* and others, and granted to him and them, "together with such others of our loving subjects as now hold certificates of qualification to practise as veterinary surgeons, granted by the Royal Veterinary College of London, and by the Veterinary College of Edinburgh, respectively," &c. &c.; so that, in point of fact, we have a Charter for Scotland already. Then I have yet to learn that it is either inefficient in its workings in, or unjust to, Scotland. On the contrary, all must admit that it has wrought here efficiently and well, and been most impartially administered.

Further, I do not see the benefit to be obtained by having a diploma from the proposed Royal Veterinary College of Scotland, instead of one from the Royal College of Veterinary Surgeons. The diploma of the Royal College of Surgeons is known and recognised in the Army, and throughout Great Britain and its dependencies, while it is doubtful if the diploma of the proposed Royal Veterinary College of Scotland would be recognised elsewhere than in Scotland. And I do not see the advantages to be derived by the possession of the proposed Charter. There is almost no provision of consequence to veterinary science and the profession which is not quite as well provided for in the Charter of the Royal College of Veterinary Surgeons as it is in the proposed new Charter. It is unnecessary for me to contrast the two, as most veterinary surgeons will do so, or have done so already.

Then, where are the funds to be got, necessary for sustaining the new college? The Charter embraces only Scotland. Suppose the whole of the students studying at our Scottish schools—a very unlikely thing to occur—were to take their licences from the new college, there would not be from this

source sufficient funds to sustain it; and I do not see any other source of income from which the staff of officials for the new college are to get payment of their salaries. Even the Royal College of Veterinary Surgeons, with its income from students, coming from all parts of the world, does not, I believe, find that its income is any more than sufficient for its efficient management. If, therefore, a new Charter is granted, it will have the effect of weakening the Royal College of Veterinary Surgeons, without creating a strong college in Edinburgh; and we will then have two weak bodies, instead of one strong one. This is to be avoided, because veterinary science and art can neither advance nor flourish under such circumstances.

The only reason that has been presented for making application for a new Charter is Professor Dick's bequest; *but the College was quite as efficient in Professor Dick's day as it has been since,* and he saw no reason for making such an application; but, on the contrary, made application along with others for the Charter of the Royal College of Veterinary Surgeons; and the only argument that I have heard is contained in the statement submitted to the Lord Advocate, before referred to, in which it is asked: Should Scotland be placed in the humiliating position of seeking a licence from an English body, and requesting to know if such an arrangement would be tolerated in surgery? Leaving out of view what would be tolerated in surgery as a matter foreign to the question, I have simply to say, that it is not the fact that Scotland is placed in such a position. The Royal College of Veterinary Surgeons is quite as much a Scottish institution as an English one; but suppose it was English, we are more concerned with the fact of whether the Royal College deals rightly and justly by us than whether it is English or Scottish; and all know that it does. Its examinations are conducted by medical gentlemen practising in Edinburgh, and not a few of the examinators are Scotchmen, and were educated at Edinburgh Veterinary College. I think this question of nationality should have no place in our discussions, and that the sooner we forget such questions the better will it be for the public and the profession. But, further than this, if you carry the argument out to its legitimate extent, you will have Glasgow thinking it humiliating to be licensed by an Edinburgh institution, for such really the proposed college, to all intents and purposes, will be. Aberdeen the same; and every other petty town insisting on its rights to license its own students.

I will now point out how, in my view, this proposed Char-

ter will be injurious to all colleges except Edinburgh. At present there are only two colleges in Scotland directly interested in obtaining a veterinary Charter, viz., Edinburgh College and Glasgow College. Both institutions are private property—Edinburgh College belonging to the trustees of the late Professor Dick, and Glasgow belonging to me—and both are incorporated with the Royal College of Veterinary Surgeons. It might, therefore, be imagined that something like an equality in the representation of the governing body would be incorporated into the Charter. But what is the fact? On analysing the list of trustees, I think the representation stands pretty much thus—Edinburgh, 18; Glasgow, 3; the rest of Scotland, 3. I place them as follows:—

Edinburgh.

The president of the Highland and Agricultural Society.
Four members thereof.
The Lord Provost of Edinburgh.
Three members of the town council of Edinburgh.
The Lord Advocate.
The president of the Royal College of Physicians, Edinburgh.
One member of do.
The president of the Royal College of Surgeons.
One member thereof.
The principal of the Edinburgh Veterinary College.
William Aitken, V.S., Kilmarnock.
Alexander Robinson, V.S., Greenock. } Both examinators for the Highland Society's diploma.

Glasgow.

The Lord Provost of the city of Glasgow.
One member of the Senatus Academicus of the University of Glasgow.
The principal of Glasgow Veterinary College.

Other Parts of Scotland.

One member of the Senatus Academicus of the University of Aberdeen.
One do. do. do. St. Andrews.
William Robertson, V.S. Kelso.

And when we take into consideration that the Highland Society are patrons of the Edinburgh Veterinary College, have endowed a chair therein, and that the Lord Provost, magistrates, and town council of Edinburgh are trustees thereof, it can hardly be supposed that these parties will

foster a rival institution in Glasgow as much as they will their own. If any question, therefore, should arise between the two schools, in which the proposed college had any power to interfere, the Lord Provost and council of Edinburgh, and the members of the Highland Society—who more than counterbalance the representation from Glasgow — could hardly be expected to favour the Glasgow school, or even do justice to it. Again, a great proportion of the work of the proposed college will be done by committees, who are to be elected by the trustees. What prospect is there that either of the three representatives for Glasgow will be elected members of these committees, and if elected, will be able to attend the various meetings thereof?

Now, when we consider further that the affairs, interests, concerns, and property of the college are centred in the trustees, that they are to appoint officials to meet in Edinburgh, to transact no business unless five trustees be present, to license schools for the teaching of veterinary science, to make and repeal bye-laws and rules and regulations, to nominate examiners, &c. &c., it will be at once seen that to give one body a preponderating influence over any other, is to put an amount of power into the hands of that body which may be used for other than beneficial purposes, and may be used for their own ends. It may be said that I am taking the view that certain parties being resident in Edinburgh will attend particularly to the interests of the veterinary college there, and that this is unfair. Just as unfair is it to say that the Royal College of Veterinary Surgeons, being seated in England, will not do justice to Scotland. But I do not take that view. I say that Glasgow and the other portions of Scotland have views and interests different, sometimes antagonistic to Edinburgh, and that Glasgow must have a certain number of trustees as exponents of its views with the power of insisting by their votes on having these views given effect to if necessary. How could this be done under the proposed Charter in any question which might be of vital importance to Glasgow College? The Lord Provost of Glasgow, one member of the Senatus Academicus and myself, against nineteen or twenty from Edinburgh. Why, there are more trustees of the proposed college, who are trustees also of Edinburgh Veterinary College, than the whole number from Glasgow put together. Of course I am not to suppose that those connected with Edinburgh will represent it only; but prejudice and interest will arise now and again, and it is always the more correct course to neutralise these, if this can be done,

and it can only be done by no part of the country having a preponderating influence over the other.

Another great want in the proposed Charter is this. Instead of members of our profession being the sole trustees, or nearly so, and managing the new college themselves, as has been so well and ably done by eminent veterinary surgeons in the Royal College of Veterinary Surgeons, the profession is left in a miserable minority. It would almost seem as if we were incapable of managing our own affairs, and that certain parties had to be appointed to do so for us. This is not right. The profession know their own wants and the requirements of the public much better than the Highland Society or any body; and the members of the profession should therefore be largely represented in the proposed measure. My own opinion is that there should always be a majority of trustees veterinary surgeons; and I feel satisfied that veterinary science will not advance in Scotland in the same ratio as elsewhere if this is not attended to. I hope then my professional brethren will consider the whole question thoroughly, and either oppose the present measure as being unnecessary, or insist on its being altered in such a way as will make it a catholic measure, fitted for the whole of Scotland, and not fitted merely to give power to the Edinburgh Veterinary College.

I purpose sending a copy of this communication to the *Veterinarian* and other papers, and shall be obliged by your reading this letter to the meeting.

I am, dear Sir, yours faithfully,

JAMES McCALL, M.R.C.V.S.,

Principal of the Glasgow Veterinary College.

SYMPATHETIC PNEUMONIA.

By W. A. Cox, M.R.C.V.S., Ashbourne.

The complications of indigestion are so numerous as to require a lengthy description; but one complication forming a part of a more particular disease has often come under my notice.

This disease I have designated sympathetic pneumonia, and I think that the name will be found synonymous with the symptoms. It is an affection that occurs at all seasons of the year: if in winter, it is seen more frequently at the period immediately previous to parturition, when the system is weaker and the temperament sluggish.

Often the immediate cause is feeding with large quantities of grains and straw chaff, the latter, probably, of a poor quality. Barley chaff will be found most injurious. But it occurs most frequently in the autumn, when dairy stock are removed from the bare old pastures to the latter grass or aftermath, when the herbage is sweet, luxuriant, and often loaded with moisture. With these the animals fill themselves to distension, when, one of them being seen to be unwell, she is kept in the shed without food for a few hours. She seems to recover, is again turned out to further gorge herself; and this process of stuffing and starving goes on for some time, until the animal is seriously amiss, when the aid of the veterinary surgeon is sought. In some instances this overloading of the stomach is not perceived, the first indications being those of disease of the lungs.

The symptoms are quick and short breathing; full, strong-bounding pulse, ranging from 80 to 100 in the minute; no tympanitis, but the abdomen much larger and tense under pressure; the fæces natural in consistence, but less in quantity; instead of the appetite being impaired the animal craves food, and a continual hoose or cough is present. On auscultation we plainly distinguish the cracking sound which, I think, may be best likened to the burning of thin, dry faggots on a fire. This noise is plainest heard during inspiration. Percussion does not much assist us, only to determine the amount of density, which will depend on the mechanical interference of the stomach pressing forward against the diaphragm. In the advanced stages the breathing is shorter and quicker, with very rapid dilations of the alæ nasi; the mouth open, and the tongue protruded; the pulse intermittent, feeble, and often so indistinct as not to be correctly taken; loathing of food, but desire for fluids; the hoose is short, painful, and partly suppressed; the animal stands up until exhausted, then drops down and dies.

The Treatment.—Bleeding, to be guided by the condition of the animal, state of the pulse, &c. Large and repeated doses of active purgatives must be given. I have never known superpurgation to take place, but have often had the greatest difficulty to produce a relaxed state of the bowels. Diaphoretics and sedatives should be given every six or eight hours. After the urgent symptoms have been relieved, I have known the hoose or cough to become worse. In these cases I have seen much benefit result from the use of Acid. Hydrocy. dil., given in doses of from x—xx℥ three or four times in the day. Extensive counter-irritation is to be

applied both on the sides and on the dewlap; setons, also, may be inserted.

In cases of protracted recovery where solidification takes place or there is a tendency to tuberculous diseases, I have found the Iodide of Potassium of service.

Great attention should be paid, both during the diseased and convalescent states, as to the diet. Linseed or oil cake, gruel, or hay tea may be given, but not in large quantities; care should be likewise taken as to the preservation of a free state of all the secretions and excretions.

Our patient should be placed in a cool airy box or shed, the legs bandaged, and the body clothed.

Terminations.—We rarely find any effusion or hepatisation unless the disease has assumed a subacute form; infiltration of blood from ruptured capillaries into the parenchyma of the lungs, producing a black, or, as some call it, a mortified appearance, is most common.

Tuberculous disease has followed in some instances.

THE PROPOSED SCOTCH CHARTER.

A Letter to C. Newdegate, Esq., M.P., by Thomas Greaves, M.R.C.V.S., Manchester.

Sir,—As one of the deputation who had the honour of waiting upon his Grace the Duke of Richmond, which deputation was introduced by you and Mr. Holland, on the 28th ult., upon the subject of the proposed veterinary school for Scotland, I am anxious to express to you, and, if possible, to his Grace, a further explanation than was then given to him in reply to a very important question which he asked, viz. "What is the feeling in the veterinary profession with regard to this proposed charter." It struck me forcibly that this question should be answered very carefully and clearly. I was anxious to offer his Grace some further information upon this head at the time, but there appeared no opportunity for me to address him. I wished to show him in what measure a sense of the veterinary profession had been obtained, which is as follows, viz.:

1st. By a petition to the House of Commons, which was signed by nearly 104 members of the profession in London in May last, praying that a charter for Scotland should not be granted.

2nd. By memorials to government, based on resolutions

passed at the various provincial veterinary medical associations in all parts of England, which are distinct from each other, comprising in the aggregate from 300 to 350 veterinary surgeons being members who have matriculated at the Edinburgh Veterinary College, as well as at the London Veterinary College. In every instance but one these resolutions were passed unanimously, praying that a charter for Scotland should not be granted. In the one instance alluded to there were only three dissentients.

3rd. By the deputation of veterinary surgeons from the West of Scotland Veterinary Medical Association who waited upon the Lord Provost and other members of the town council of Edinburgh, on the 30th of October last, at the Edinburgh Veterinary College, expressing a strong condemnation of the proposed charter; and, although several members spoke, not one of them gave an expression in favour of a separate charter for Scotland at all.

4th. I attended the opening of the session at the Edinburgh Veterinary College for the purpose of conversing with the Scotch Veterinary Surgeons who assembled there, to ascertain their feelings with regard to the proposed charter. I conversed with some gentlemen practising in Edinburgh, also with others practising in Glasgow, Greenock, and other places. I was really astonished to find so great an amount of apathy and supineness amongst veterinary surgeons there about the proposed charter; I did not meet with a single one in favour of it as it now stands. Some I found were more in favour of a charter than others, if such charter was considerably modified; but I did not meet with a single one who was particularly anxious for a charter at all. If I must speak the whole truth, I conversed with several there who expressed opinions very strongly against a separate charter for Scotland of any kind being granted.

5th. A few months ago, for the purpose of ascertaining the per-centage of the profession in favour of the proposed charter, I forwarded a circular to each member (over 500), who had graduated at the Edinburgh Veterinary College, and who had obtained a diploma from the examining board appointed by the Highland and Agricultural Society of Scotland; nearly 100 of these circulars were returned through the dead letter office, 150 members replied. Of these, 135 were decidedly opposed to a separate charter being granted for Scotland; 15 only out of 500 appear to have expressed an opinion in favour of a separate charter being granted to Scotland, many of the 135 replies were written in the strongest terms urging me to use all means possible to induce Government

not to grant a separate charter for Scotland. These replies are from men thoroughly conversant with the working of the whole question, men who have witnessed the lamentable consequences of two colleges rivalling each other, and dividing into two parties a small professional body, weakening and lessening the influence and dignity of the profession, lowering its status by the unceasing detraction and disparagement of each other, not only by the principals and all officers under them in each institution, but also by every student who emerges from those respective colleges, carrying with him the same feelings, and being actuated by these partisan sentiments, so much so that it is often witnessed as these respective members come together in their daily avocations, each one seeming to say by his conduct to the other, "Stand aside, for I am holier than thou." The profession is convinced that the proposed charter if granted would perpetuate this very objectionable state of things, by legalising it.

What the profession wants and is now most earnestly praying for is, that it may be a united profession, under one parental institution or authority, which must ensure a united household, as one united family, instead of a house divided against itself.

I humbly submit that the members of the veterinary profession should be the best judges as to what appertains to the well-being of their own body.*

STRANGULATION OF THE INTESTINES AND RUPTURE OF THE PERITONEUM.

By Henry Seton, Jun., Veterinary Student, Edinburgh.

On the 2nd September, 1867, at the request of Mr. B—, a dairyman, I went to see a black mare, which was used by him for carting purposes. She had shown symptoms of abdominal pain during the two previous days. On my arrival I found her standing, occasionally pawing with her fore feet, and looking round to her flank. I asked the owner if he had administered any medicine to her, and what symptoms she had shown of illness previous to my being sent for. He replied the first thing he noticed was looseness of the bowels, after which griping pains came on, which returned at intervals. He also stated that he had given an

* In a letter received from Mr. Newdegate, that gentleman informed Mr. Greaves that he had transmitted the above letter to His Grace the Duke of Richmond.

ounce of nitre mixed up with a bran mash, which she had eaten.

The place she was in was a small loose box, and during the time I was with her she laid down and rolled about, then got up, shook herself, and began to pick a little bit of her bedding, also voided a small quantity of urine. Her pulse was quite natural. She had had no action of the bowels since the purging had ceased, two days before.

Treatment.—I administered an antispasmodic draught, containing

Sol. Aloes, ʒvj ;
Tinct. Opii,
Spt. Ether. Nitric. aa, ʒij ;
Ol. Lini, Oiss. Misce.

Followed this up with copious clysters, and applied friction to the abdomen, and hot rugs. After staying with her for two hours she seemed much relieved, and had passed a small quantity of dry fæces. I then left her, giving her owner instructions to watch her until I returned. At 2 p.m. I found her lying quite quiet, but nothing had passed since I left. The pulse, however, continued natural. I got her up, and gave her a few clysters, after which I left, leaving orders that if she got worse to let me know at once.

Sept. 3rd.—At 8 a.m. I found her in a little more pain, pawing and scraping, and looking round at her flanks ; when lying she did not roll much. She urinated a little, but the bowels had not responded. She sat upon her haunches for several minutes at a time, and on getting up her pulse was natural. I applied flannel rugs, wrung out in boiling water, to her abdomen ; gave Aloes ʒvj in solution, and repeated the clysters. In the afternoon the bowels acted freely, which afforded immediate relief. In the evening I found her standing perfectly quiet and free from all pain.

Sept. 4th.—The owner called and said the mare was very bad again. At 8 a.m. I found her pawing and scraping as before, and looking round to her flank. She had passed nothing since the evening previous. She was frequently lying down and sitting upon her haunches. Pulse 60; rather weak and indistinct. Gave a draught containing

Tinc. Opii, ʒij ;
Sol. Aloes, ʒvj.

Applied mustard freely to her abdomen ; also turpentine, after the action of the mustard had ceased. During the day I repeated the clysters and re-stimulated the abdomen, and as the bowels continued constipated I gave Aloes ʒiv in

solution. The animal, however, gradually got worse, and died about 10 p.m.

Post-mortem examination the following morning. — On making a section through the linea alba and raising up the parietes of the abdomen, I found a rupture of the peritoneum lining the abdomen, about four inches from the linea alba, and about fourteen inches long; also about six inches of the transversalis abdominis muscle, and the fibres of the rectus abdominis ruptured. About two feet of the small intestines were strangulated, through a rupture of the mesentery, which was much inflamed. The rest of the viscera were in a healthy state.

During the illness of the mare she was never tympanitic, nor had she received any injury externally from a kick or other cause. She was always carefully used and driven by her owner; therefore the rupture of the peritoneum is rather a peculiar lesion, and one I cannot account for.

Facts and Observations.

Source of Hippuric Acid in the Urine of Herbivora.—MM. Meissner and Shepard have, partly at least, succeeded in referring the origin of this acid to the cuticular membrane covering the higher plants, on those surfaces which are freely exposed to the air. Its chemical relations are allied to cellulose, than which it is more digestible. They also agree with those writers who aver that the addition of straw and hay, which provoke an abundant excretion of hippuric acid, of an easy digestible and non-nitrogenized as sugar, causes an increase in the quantity of the urea and a decrease of the hippuric acid. The quantity of this last-named acid excreted they also find to depend upon the general vital conditions of the animal, and other circumstances; thus, when at work, under like conditions, a horse excretes more than when at rest. An elevated temperature appears likewise to increase the excretion of succinic acid and urea, and diminish that of the hippuric acid. Individual peculiarity much influences this also. An intimate connection is said by them to exist between calcic carbonate and hippuric acid. When this latter is abundant the urine is strongly alkaline and turbid with calcic carbonate.

Succinic Acid in Blood.—It is stated by Dr. Meissner and C. Shepard that the normal blood of the herbivora

always contains succinic acid, but never benzoic or hippuric acids. The hippuric acid met with in the urine of the herbivora, they say, is first produced in the kidneys, and is not simply separated by them from the blood; there is no clue to the nitrogenized substance which gives rise to it, and certainly it is not urea.

How to Crystallise Carbon.—The following process is given by M. Lionnet:—Take a long thin leaf of gold or platinum, and wind round a helix formed of a similar leaf of tin, so that the covered and the uncovered portions of the first named metal shall be about equal. With this metallic couple a spiral is made, which being plunged into sulphide of carbon, the sulphur combines with the tin, and the carbon is precipitated in the form of crystals.

Accumulated and unapplied Force a Substitute for Fuel.—Mr. Grove, in his inaugural address at the late meeting of the British Association for the Advancement of Science, observes in reference to the absorption of force, that, as the sun's force, spent in times long past, is now returned to us from the coal which was formed by its light and heat, acting upon carbonic acid and water, so the sun's rays, which are daily wasted, as far as we are concerned, on the sandy deserts of Africa, may hereafter, by chemical or mechanical means, be made to light and warm the habitations of the denizens of colder regions. The tidal wave is, again, a large reservoir of force hitherto almost unused. The discoveries of Graham, by which atmospheric air, drawn through films of caoutchouc, leaves behind half its nitrogen, or, in other words, becomes richer by half in oxygen, and hence has a much increased potential energy, not only show a most remarkable instance of physical molecular action, merging into chemical, but afford us indications of means of storing up force, much of the force used in working the aspirator being capable at any period, however remote, of being evolved by burning the oxygen with a combustible. What changes may take place in our modes of applying force before the coal-fields are exhausted it is impossible to predict. Even guesses at the probable period of their exhaustion are uncertain. There is a tendency to substitute for smelting in metallurgic processes liquid chemical action, which of course has the effect of saving fuel; and the waste of fuel in ordinary operations is enormous, and can be much economised by already known processes. It is true that we are at present far from seeing a practical mode of replacing

that granary of force the coal-fields; but we may with confidence rely on invention being in this case, as in others, born of necessity, when the necessity arises.

Isomeric and Allotropic forms of Bodies.—The chemist, says the same writer, recognises two singular classes of bodies, the one he terms *isomeric* and the other *allotropic*. The isomeric consists of substances differing widely in appearance and properties, and yet composed of the same proportions of the same materials. In some of these bodies the quantities of the elements are the same in actual weight, in others the proportion is kept, but the quantities may be twice as great or even thirty times as great. The separate bodies of an isomeric series receive separate names, but allotropic bodies of the same pair or series have only one name, being considered as the same thing in two or more different states, of which there are many illustrations.

Manufacture of Artificial Manure.—In the *Journal d'Agriculture Pratique*, M. Barral gives some interesting details on the subject of the manufacture of animal manure at Aubervilliers. This manufactory consumes every year 8,000 horses, 200 donkeys, 300 cows, 300 pigs, 9,000 cats and dogs, 6,000 kilogrammes of meat unfit for food, 500,000 kilogrammes of offal from the Parisian abbatoirs, and 600,000 kilogrammes of other refuse animal matters, such as skins, horns, &c. The raw material is first cut up and boiled to extract the grease. The flesh is then separated from the bones, pressed, and dried. It is afterwards ground and sifted, and the dried bones, which are also submitted to the same process, mixed with it, forming a manure, containing 35 per cent. of nitrogen and 55 per cent. of phosphate of lime. The blood is collected separately, and also made into manure. The soup obtained in the boiling is strained, and the solid matter thus collected is added to the rest. The offal is piled in alternate layers with other organic matter, such as wool and parings of horns and hoofs, with which is mixed a certain amount of mineral phosphates. The heap is well moistened with the strained soup, fermentation is set up, and the whole is gradually transformed into excellent manure. During this process the phosphate of lime breaks up into phosphoric compounds, more or less soluble, and various salts of ammonia are formed. This is really a much better use to put dead horses to than making them into *saucissons de Lyon* or *filets de bœuf* for the cheap *restaurateurs*.—*Chemical News*.

THE VETERINARIAN, JANUARY 1, 1868.

Ne quid falsi dicere audeat, ne quid veri non audeat.—CICERO.

ANNUAL ADDRESS OF THE EDITORS.

"Hark, how the bells ring! Ah! the old year is past,
And the new year has entered with hope on its brow;
It is bright as the olden one, fair as the last:
Let us grasp its young hands with a warm-greeting vow,
As we blessing it, bow."

"One year—one year—one little year,
And so much gone!
And yet the even flow of life
Moves calmly on."

We have passed over another time-mark and entered upon the threshold of a new year. The endings of periods possess an interest, as do their beginnings; yet these often differ. To the former may belong regret or satisfaction, depending upon circumstances, although either the one or the other may be of no avail, as the events that gave rise to them have passed away; but the latter are always big with expectation and hope.

The rapid flight of time has not been inaptly compared to the passing of a weaver's shuttle, as it carries the woof from side to side so swiftly that it can hardly be seen. We glide into boyhood with a consciousness of being children still, and into manhood with all the buoyancy of youth; while we are almost trembling beneath the weight of the grasshopper ere we have stepped from the platform of active life. Thus silently, and almost unconsciously, we pass from one stage of existence to another, and often we are all hurried past the great stations of life to its solemn and universal terminus.

"Life hurries on to meet the point it sprung from,
Youth starts from infancy, and age returns."

This hurry has been designated "the breathless haste of life." We heed indeed but little the passing hour, the day, the year. That which is just gone has not been more rapid in

its transit than others that have gone before it; yet it seems but as yesterday we were penning our Annual Address, and doubtless it has left records for eternity. But it is with the past we have now to do, and of it to take a retrospect. The future is all to us unknown. We cannot pierce the veil that, like a mist, enshrines it, climbing the mountain top and hiding the distant valley from our view; but we may express our hope that, as the past has been, so will the future be—rich in works conducive to the end we have in view. It has been paradoxically said nothing is certain here below save uncertainty. Our best devised projects may be overthrown, our most sanguine expectations never realised; still all this we are contented to leave, not being believers in blind chance; a belief as senseless as destructive of all exercise of thought, all love of labour for ourselves or others, all aspiration, and all hope. We are not as weeds thrown upon the waters, to be tossed and whirled about in the eddying pools of capricious chance; our future, as well as our present and our past, are appointed periods of our existence, although it may be there is much we cannot unravel in the seemingly tangled thread of Providence. Our lives are no more a fortuitous concurrence of circumstances than are our bodies the result of a fortuitous conglomeration of atoms; all is fore-ordained, albeit this is only an embryotic state of existence, and

> "Embryos we must be till we burst the shell—
> Yon azure ambient shell, and spring to life,
> The life of Gods, O transport! and of man."

These recurring seasons are to us

> "As when o'er-laboured, and inclined to breathe,
> A panting traveller some rising ground,
> Some small ascent has gained: he turns him round,
> And measures with his eye the various vales,
> The fields, woods, meads, and rivers he has passed."

So may we from our stand-point look back upon the past year and review its doings.

Placed as sentinels, to guard the outposts and give notice of approaching danger, we have endeavoured at least to do our duty uninfluenced by favour and undeterred by fear. We hold that, in the present age, it behoves us to be ever on the alert, watching all that is going on around us, and appro-

priating that which is conducive to our usefulness and consequent advancement. We dare not slumber; self-denying exertion must continue to be made by us, for we have not arrived at the zenith of power; and yet, on the other hand, there is no decadence, no falling away; all speaks of progress. Assaults from the enemy may, it is true, be anticipated still to take place, and if the profession has to be defended, it must not be by feeble hands; we must be able to show that something has been done by us in past years, and, if missiles are brought to bear on the fortress, that we are not untrained in the art of defence.

It is gratifying, on taking a cursory review of our transactions, to be impressed with the conviction that they have been productive of some good. Our journal enters upon the forty-first year of its existence, more than one third of which time we have been privileged to conduct it; and looking back to beyond that period, in connection with the profession, and comparing its status and its prospects then with what they are now, we think we may confidently assert that large advances have been made. We sincerely trust that what of late years has taken place amongst us, will not prove mere spasmodic efforts, but be real and abiding acts, giving proof of firm cohesion and stability, so that an imposing front may be presented whenever there is a "needs be" for it. Only let there be no division in the body, of which we perceive there are some indications. It is true of a community as of a kingdom—"divided against itself it cannot stand." It is also always much easier to pull down than it is to build up.

As it respects the literature of the profession, we believe that a more healthy tone pervades it. Personalities are less indulged in, and a more friendly feeling is evinced in the remonstrances made against any fancied or real breaches of professional conduct. Truly Herbert has said, "Good words are worth much and cost little." We do not mean by this that we have never allowed a controversial spirit to show itself in our pages. Far from it; differences of opinion ever will arise, and if rightly expressed they may prove beneficial. Moreover, we like outspoken proofs of independent feeling, concurring with the Duke of Argyll, who affirms that the independence of individual action is the best safeguard of

truth. It is when these differences in opinion give rise to an acerbity of temper, and a cavilling, carping spirit, that we condemn their manifestation as being subversive of that which ought to exist among us.

As journalists, we have very much to acknowledge. The kindness of our correspondents has not only been great but continued. The commencement of the last year brought with it such a large amount of matter that an increase of the size of the first number was required, and again and again we have been compelled to resort to the same expedient, to meet the demands made upon our space. And here we would at once observe that these double numbers we would fain avoid; they are not to us profitable, but what are we to do with the contributions of our friends? The free use of small type, and the giving of additional pages, have not sufficed to give to them publicity, and often we have been apprehensive that delay would be construed into neglect and indifference. This state of things not being unanticipated, we resolved, when the duty was taken off paper, rather than lessen the price of our journal, permanently to increase its size, and to print it on paper of better quality. Yet have we very rarely confined ourselves to the limit then set, but have again and again given additional pages to meet the emergency. Not that this has been done reluctantly; nor have we any cause for regret in having undertaken the duties of editors, but contrariwise, much satisfaction. And as we began, so we intend to continue; not for a moment fearing any withdrawal of the encouragement and assistance that have been so long accorded us. With a degree, and no small one either, of justifiable pride, we point to the list of our contributors whose labours have not failed to enrich our pages during the past year. Professor Varnell's observations on the morbid parts sent to him have been, as usual, full of instruction, as well as his series of papers on "certain diseases incidental to the horse." The translations by Mr. Ernes have been uninterrupted, and have lost none of their interest; and the same may also be said of the papers by Professor Tuson and Brown; especially of the "Series of Analytical Tables" for the use of students by the former, which cannot fail to be referred to by them with profit, and the "Use of the

Microscope in Veterinary Medicine," by the latter. We might particularise others, as well as express our obligations to those who have deemed it right to advocate our cause publicly; but that which will for ever render the last year's volume one of worth and notable was the issuing of a "Special Number," consisting of nearly one hundred pages in small type, containing a full report of the annual meeting of the Royal College of Veterinary Surgeons, and more especially of the Veterinary Congress, held in London, the merit of which is wholly due, both for convening it and the papers read thereat, to the provincial members of the profession. We trust our readers were satisfied with this report. Our desire was to render it worthy of those who took an active part in the meeting. May a repetition take place as often as circumstances may deem it wise and beneficial. It is this co-operation that we delight in, for it indicates mind-progress among us, and is conducive to the best interests of the body. It bespeaks a love of our common art and science, which must receive an impetus from the labour of those thus engaged, and from which the profession and the public alike will be advantaged. While on this division of our review, we may be permitted to regret the interruption of the papers on Botany, by Mr. Watson, the cause of which has been ill health, and sincerely to express our hope that it may please the Disposer of events soon to enable him to resume them. We know they were highly estimated by our readers.

This superabundance of matter, while to us highly gratifying, as a proof of the confidence placed in us, cannot have failed in a corresponding ratio to benefit the profession as a body. We have been merely channels of communication; the facts and information recorded have emanated from the members of the profession, individually or collectively. As public journalists, we ought to subserve the interests of the public, and we are desirous of doing so as far as our connection with it goes. But we work for a particular portion of the community, not, however, for one section only, but for the whole. Partisanship we detest; our aim and object are that all may be profited by our labours. Some persons may not know that exclusive journals have been tried, again and again, and have failed, involving much pecuniary loss, as well as labour of

mind. We are no advocates for exclusiveness. We believe that real mental life can only exist, and activity wide and beneficial in its results, flow from the diffusion of knowledge. We would not that the mind be cooped up, or thoughts contributing to the good of others be restrained; they should be given perfect freedom to, and the fruits thereof will be sure to follow. We take no "leap in the dark" in thus advocating the diffusion of information. Information uncommunicated is like seed that is unsown—it abideth alone and is unproductive; but let it be disseminated—let it be sown in good ground, and soon we shall have "first the blade, then the ear, after that the full corn in the ear;" which will bring forth "some thirty fold, some sixty, and others an hundred;" so that both he that gives and he that takes is blessed with an increase.

As yet we are very far from perfection. Nevertheless, we have the precursory fruitbud; we witness, too, the dawn of a brighter day; and it will be our own fault if we do not go on from less to more, and obtain still greater things. The foundations of our profession are laid in truths on which to build, and we have among us the materials for the superstructure. Let us then be up and doing, taking pleasure in the performance of our duties, hoping that all success will crown our efforts ere long.

That the proceedings of the different Veterinary Medical Associations should continue to occupy so large a portion of our journal is both gratifying and desirable. We readily accord them space, as we look upon them as sources of information and of power to the profession, both now and in the future. In like manner, the proceedings of the Council of the Royal College of Veterinary Surgeons have been, during the year, big with importance; beneficial results from which we may confidently look for. As we are yearly increasing in numbers, and consequently in strength and position, so it may fairly be anticipated that the younger members of the profession will become desirous of enrolling themselves as members of the Medical Society, meeting in the county in which they reside. Thus they will both enlarge the sphere of the operations of these societies, and impart to them new vigour, by the introduction of the more recent views connected with

the Science of Veterinary Medicine. We need hardly add that such is in every sense to be desired. If the well-being and the well-doing of a people be the reflex of an individual, it will follow that the same will obtain with a section of the community. Each should therefore so act as if on him depended the weal of the whole. Among us we are glad to see that here and there one and another are influenced by this motive. They single themselves out by their actions, which are pure and disinterested. But where are the many? Where is that open, candid co-operation, that is not only so desirable, but absolutely necessary, for the continued advancement of the profession? Why is it that some keep themselves so much aloof, and never by act or deed give proof of their membership, or promote our onward progress? Nevertheless, despite all this, we have progressed, and must continue to do so, although aided by only the few; but how much more rapid would our advancement be were the many actuated by the same spirit! We have never entertained the utopian idea of uniformity, earnest as we have been in advocating unity. "They be two things," says Lord Bacon, "unity and uniformity." Further, uniformity has been described as the offspring of tyranny, and unity as at once the fruit of freedom and its safeguard.

Thus have we passed in review the steps we have taken in the way of progress during the past year, and we think we may venture to hope that we shall leave some "foot-prints on the sands of time." Nor would we have them quickly effaced, like traces on the water; on the contrary, we would that they may prove abiding and become incentives to others, both to deepen and multiply them. A large field yet remains for cultivation, and a succession of crops can only be secured by continuous and rightly-directed labour in it.

The characteristics of the present time are so patent to all, and transparent, that he who runs may read them. The "running to and fro," and the "increase of knowledge," announced to Daniel, are evident and more than suggestive. "All the world is fast becoming one habitation, as it were, and the whole human race one family. The rail and the telegraph are links of cohesive union, that are swiftly blending the interests and the sympathies of the most distant lands. By them nations are being brought nearer and nearer to each

other; intelligence, or the knowledge of passing events, is becoming universal, and as these facilities for communication must increase in number and efficiency, they will become proportionately useful."

In closing this address, we must be allowed to advert to that which, although a less pleasing, is not a less profitable theme, if rightly considered—the decease of members during the year. It may be that our obituary for the past year is not greater than antecedent ones; still there are in it the names of those with whom we were once associated. They have passed away, their work and labour done. They will soon be forgotten as a dream, and others take their places, for gaps in every circle are quickly filled up; since the wheels of the great machine cannot be allowed to stand still while anything remains to be done; and there is much. Nevertheless, we have a word of affectionate remembrance for those who have gone before us, and of encouragement for those who remain. May they excel them in well-doing, in earnestness and zeal, tempering the same with judgment, so will they best supply the loss we have sustained and fill up the broken circle of usefulness.

"This is the bud of being, the dim dawn,
The twilight of our day, the vestibule:
Life's theatre as yet is shut, and death,
Strong death, alone can heave the massy bar,
This gross impediment of clay remove,
And make us embryos of existence free."

Extracts from British and Foreign Journals.

CARBOLIC ACID.

There is little doubt that this acid was used by the early Egyptians in some crude form in their process of embalming. Its full value, however, is not yet appreciated. Upon the experience of Lemaine and Crookes we may trust it to destroy almost all kinds of animalcules and insects when applied in the form of vapour. It is not strong enough, however, in this form to act injuriously on animals larger than mice. An

aqueous solution added to water, in which a small fish was swimming, proved fatal in a few minutes. Flies and mosquitos have an intense aversion to the vapour of carbolic acid—a fact which thrifty housewives and all who find themselves annoyed by these insects will probably not forget. A small quantity exposed to the air in a cup will keep a room entirely from these little household pests. It also banishes cockroaches, bed-bugs, ants, and vermin of all kinds, merely by making a weak solution of the carbolic acid and water and washing the infested places.

On the fœtid gases produced by putrefaction carbolic acid seems to have very little effect; but it attacks their causes, and puts organic matter in such a state that it never reacquires its tendency to putrify. This is curiously shown in some experiments recently made by Mr. Crookes. Some meat was hung up in the air until the odour of putrefaction was strong. It was then divided into two pieces, one of which was soaked in chloride of lime solution, and then washed and hung up again. The offensive smell was entirely gone. The other piece was soaked in water containing one per cent. of carbolic acid. It was then dried and hung up. In two days' time the offensive smell had been replaced by a pure but faint odour of the acid. After a few weeks the piece of meat that had been deodorized by chloride of lime smelt as offensively as it did at first, while the piece treated with carbolic acid had no offensive odour whatever. It was then hung up and examined at the end of a month. No change had taken place. Another experiment shows its power to prevent putrefaction in a still more striking manner. A piece of meat was soaked for one hour in water containing one per cent. of carbolic acid. It was then wrapped in paper and hung up in a sitting room in which there was fire almost daily. At the end of ten weeks it had dried up to about one fourth its original size, but looked and smelled perfectly good and fresh, a very faint odour of carbolic acid being all that was perceptible. It was soaked for twenty-four hours in water and then stewed with appropriate condiments and eaten. It was perfectly sweet and scarcely distinguishable from fresh meat, except by possessing a very faint flavour of carbolic acid, not strong enough to be unpleasant.

Carbolic acid, because of its wonderfully destructive power over minute animal organisms, and because of the immediateness with which it arrests putrefaction, may be relied upon to destroy the infection of cholera. The cattle plague yields to it, and Dr. Angus Smith has proved that the putrefactive decomposition of soils which produces malaria, does not take

in presence of very minute quantities of this acid. On tracts of land to which sewage disinfected with carbolic acid has been applied, obnoxious insects disappear, vegetation becomes healthy and luxuriant, the sheep are free from foot-rot, and potatoes from disease. It is never unpleasant or injurious to cattle. They lick the woodwork of their stalls after it has been sprinkled with diluted acid, and readily drink water in which it has been dissolved. In his report of the Royal Commission for inquiring into the origin and nature of the cattle plague, Mr. Crookes, whom we have already mentioned, and upon whose experience we have largely drawn, affirms that he has never met with a single instance in which the plague has spread on a farm where this acid has been freely used. Vaccine virus, treated with carbolic acid, loses its virtue at once. We may conclude from this that it will destroy small-pox poison. Some experiments made by Dr. J. P. Loines, of this city, prove that chlorine has no such effect. He immersed the vaccine crust in chlorine of sufficient strength to be irrespirable, and also to destroy the cork which was used in the bottle. After a week of this treatment the crust was found to produce perfect vaccine vesicles.—*Mining and Petroleum Standard.*

SCIENTIFIC EDUCATION IN OUR PUBLIC SCHOOLS.

Mr. Farrar, at the late meeting of the *British Association for the Advancement of Science,* directed the attention of its members to the deficiency of scientific education in our public schools. It is remarkable that a country which has done so much for science as ours, in the way of discovery and invention, should, until very lately, have almost ignored science as a subject of general education. The classics have been made the principal school study. This may be all very well, and, in one sense desirable, since the sciences, perhaps, are better understood through a knowledge of them; but surely this never should have been the case, to the exclusion of the former. But a better time is coming, a clearer light is shining, when each will be found to possess its proper place. Nevertheless, it must be allowed that the lack of an acquaintance with the principles of science has been productive of much loss, practically considered, and its study not having been duly recognised, the "many" are ignorant of scientific knowledge generally, and hence its non-appreciation of its advantages by them.

Mr. Farrar, after commenting on the immense progress

which had been made in science during the present century, extending to the investigation of laws whose very existence had been unknown, observed: "Yet the time was not long past when science was treated in all educational schemes with contempt, and it was a humiliating reflection that scarcely one of our most notable men of science could be claimed by any of the great public schools. It could not indeed be said that a classical education exercised a deleterious effect upon science; yet its influence thereupon was, it could not be denied, nugatory. The problem now set before us was, not to supersede, but to expand and superadd to classical education. He contended that the introduction of science into the public school system is necessary—1st, because it calls into play a series of faculties at present left untouched. Patience, attention, self-discipline, a power of reasoning, taste, and a real insight into the nature of language, are all fostered by the study of the classics; but it teaches nothing of order, method, accurate observation, the comparison of phenomena, or the classification of facts. Millions of apples had fallen before Newton, sitting in the orchard, thought out the law of gravitation; thousands of persons had seen the great bronze lamp swinging in Pisa Cathedral before it suggested to Galileo the conception of the pendulum. It may be that discoveries so remarkable as these might not have been made the earlier for special training, but myriads of minor discoveries which are yet of infinite importance to human life are due simply to the gift of walking through the world with open eyes. 2nd. Not only will scientific training thus call out additional faculties in minds which have already gained from the study of language, but it will also call out the same faculties in minds for which the study of language has accomplished little or nothing. Minds are of different types, and it is an intolerable hardship that a boy who perhaps is destined to do more for his generation than any thousand scholars should be deemed dull and stupid because wholly unsuited to linguistic studies. Yet Newton, Watt, and Davy were all considered insignificant and backward boys. Speaking from his own experience, Mr. Farrar asserted that the boys who showed most interest when he gave them an elementary lesson on science were often those who had been most apathetic in their classical studies; and he quite bore out the evidence of Dr. Evans, head master of Birmingham school, that whilst for many boys a classical education is of priceless benefit, there are many more for whom after a certain period it is a positive and unmitigated failure.

3rd. While Greek, Latin, and mathematics should always be made the basis of a liberal education, it would be of obvious advantage to unite to these studies, whose use the average boy can never be made to understand, studies whose immense practical importance and future advantage are clear to the weakest intellect. Our public schools are no longer nurseries solely nor chiefly for the universities. There is an immense number of boys who, when schooling is over, enter the army, the navy, the civil service, &c. A special education for each different profession would not be desirable, but while all boys should be taught classics, mathematics, and modern languages, which are of use to them in any profession, some attention should surely be paid to subjects which have a practical value in their particular profession. Even taking the broader ground of general education, scientific education is useful. For instance, how many ridiculous systems of philosophy, how many exhibitions of dogmatic ignorance triumphantly taking itself for knowledge, how many wild attacks on scientific discovery characterised only by immeasurable arrogance and unfathomable ignorance, might the world have been spared if the boys who grow up to be the clergy of England had been taught to touch the clear fountain of science with but the surface of their lips! In this respect of scientific training continental education is vastly superior to our own. Mr. Farrar then proceeded to point out some of the obstacles which lie in the way of scientific training. First, there is the difficulty of finding time for it. On the one hand, masters, who are by no means disposed to look upon science with jealousy, hold that the present subjects of teaching could not be curtailed without serious disadvantage; on the other hand, the healthy sports which form so important a part of the training of boys ought not to be diminished. This objection is more apparent than real, as was shown in the description which Mr. Farrar subsequently gave of the arrangements which already exist in some of our public schools for scientific teaching. But independently of these, he held that the hours now wasted in that most unprofitable of employments—composition—unprofitable *i.e.* for young boys, unprofitable until boys are old enough to look upon it as a privilege and enjoyment, instead of an incubus and a penance—might be diverted with great advantage to science. The want of method is at present the chief impediment. In most schools there is no system, and there are scarcely any text-books. The Association would confer a great public benefit if it would draw up something like a programme of study. Mr.

Farrar then said that, although it might not be generally known, at most of the public schools there is some provision made for scientific teaching, and at Rugby it has been very successful. At Harrow it is left chiefly to voluntary effort on the part of both masters and boys. There are voluntary examinations; prizes for collections in natural history; a scientific society among the boys, at which papers are read, some of which have lately been published, and show much accurate and varied information. In that society there is at the present time one of the most able and brilliant boys in the school. At Rugby everybody is taught different sciences in different years. Mr. Farrar considered that the ideal of scientific teaching would be a combination of the Harrow and Rugby systems. Referring, in conclusion, to the wretched practice by which all boys are compelled to learn composition, Mr. Farrar said: Some iconoclast is wanted to break this huge gilt idol of modern education, and already I am happy to feel convinced that it is beginning to totter upon its pedestal, and that the hour of emancipation from its idle tyranny over many English boys is near at hand. I believe that its partial or total fall will be accompanied by a more expansive and profitable teaching; and, when that is inaugurated, we hope that England will be the gainer in a multitude of ways—that those who now hold the autocracy of science may no longer be subjected to the distrust or persecution of bigoted folly, and that thousands who now grow up in ignorance or in the violation of the simplest laws of nature may learn that those laws are God's handwriting upon the universe that He has created, and that there is not one of them on which do not depend, in a greater or less degree, the welfare, the progress, the dignity, and the happiness of mankind.

ON SPECTRUM ANALYSIS.

ALTHOUGH there is doubtless yet much to be ascertained in reference to the above mode of analysis, there can be no doubt but that it will ultimately become, in the hands of the observant and careful operator, a means of detecting very minute quantities of matter, either in its simple or combined state.

Already it has been useful in demonstrating the existence of new elementary substances, and in several medical investigations, and the time is not far distant when it will be

generally resorted to for the detection of the presence of foreign matters, its delicacy being so very remarkable.

Mr. H. E. Roscoe, B.H., F.R.S., in a lecture lately delivered by him on the subject, states as follows:—"The fact that certain substances tinge flames of certain colours has been known for a long time, and has been made of use to detect their presence. Thus, sodium gives a yellow tinge, potassium a violet tinge, lithium a red tinge. This, however, is a rough and approximate method. The spectrum analysis is a further refinement, for the flame of each volatilised substance, when examined by its spectrum, presents its own peculiarities. Thus the flame of volatilised potassium gives particular lines in the red, and in the violet part of the spectrum; sodium produces one bright yellow band; lithium, one bright red and one yellow band; strontium, a number of red bands and a violet band; copper, bright red band and a green band; barium, many bands. The bands form a distinctive advantage of this method. For instance, a mixture of lithium and sodium when volatilised, tinges a flame red and yellow, but the yellow tinge of the sodium flame overpowers the red tinge of the lithium flame, and the latter is, consequently, not perceived by directly viewing the flame. But the spectrum of this flame exhibits the distinctive bands due to lithium as decisively as if no sodium at all were present. In fact, each of a mixture of substances gives peculiar bands to the spectrum of a flame in which the whole are volatilised, as distinctively as if it alone were present.

"This, however, is only one of the advantages of the method of spectrum analysis; its extreme delicacy is another, whereby it has revealed the frequency, it may almost be said the universality, of the occurrence of many substances formerly supposed to be very rare. For instance, lithium, formerly only known to occur in four minerals, is now found to be a substance widely diffused, and present in blood, milk, in Thames water, &c. Thus, the spectrum analysis may add, in a most important manner, to our knowledge of terrestrial matter; lithium, for example, may be necessary to the structure of the animal organism. The presence of 1-6,000,000th of a grain of lithium is easily detected by the spectrum; so is that of 1-180,000,000th of a grain of sodium.

"These two characteristics of the method of spectrum analysis, viz., its decisive indications and its extreme delicacy, have already led to the *discovery* of four new elementary substances. The history of these is very interesting —that of two of them, *cæsium* and *rubidium*, particularly so.

"R. Bunsen, the celebrated chemist of Heidelberg, happened to be examining the residue of a mineral water, to find potash and soda, after having separated all other substances in the ordinary way. By the spectrum he at once discovered the characteristic bands of potassium and sodium, but he also perceived new lines which he did not at first recognise. So confident was he in the trustworthiness of the method he was applying, that he at once said, "I have discovered a new metal." He set to work to evaporate 40 tons of the mineral water, and he discovered in the residue *two* new metals, of which we have now a complete chemical history. Rubidium is indicated by a red line, not quite so refrangible as those of potassium, and by magnificent purple lines; cœsium by blue lines. These metals resemble potassium very closely, and their spectra have a certain analogy to each other and to the potassium spectrum. They have, in fact, been repeatedly mistaken for potassium, and no ordinary method of analysis affords the means of discriminating them from that metal. Rubidium has been found to be present in many substances, as in the beetroot, &c., and in most mineral waters.

"The other two new metals which have been discovered by the spectrum are *thallium* and *indium*. Thallium was discovered by the English chemist Crookes, who was examining some seleniferous pyrites residues, and saw certain green lines which belonged to a new elementary body. Thallium occurs in comparatively large quantities. Indium was discovered by two German chemists: only very minute quantities of it have been found.

"If a mixture of substances is volatilised, and the light of the flame in which they are volatilised is examined by the spectroscope, the spectra peculiar to their presence come out one after another in the order of the volatility of the substances, thus affording a magnificent dissolving-view succession of spectra. This was illustrated by volatilising a mixture of salts of potassium, sodium, lithium, barium, cœsium, and strontium in the electric lamp.

"Although the present advanced state of prismatic chemistry is due to the labours of Kirchhoff and Bunsen, other chemists, many years ago, made observations of a similar kind. In 1752, Melville observed the effect of soda on flame. In 1822, Brewster made further observations, and in the same year Sir J. Herschel described spectra of several coloured flames in an article on light in the 'Ency. Metropolitana.' But Fox Talbot, in 1826, was the first to make definite observations on this point. He describes the method of

discriminating substances by means of the bands of spectra, and in Feb., 1834, writes, that a glance at the prismatic spectra of substances may afford a certain and ready method of ascertaining the nature of the matter composing them. Again, Professor Miller, of King's College, obtained in 1845 many interesting and important results of observations of the spectrum of barium, &c.; but he worked under the disadvantage of not having a flame itself non-luminous, in which to volatilise the substances he was investigating. The labours and discoveries of Kirchhoff and Bunsen were published in 1859 and subsequent years.

"In order to obtain the spectra of metals not volatile at ordinary temperatures, it is necessary to volatilise them by the intense heat of the electric spark. So treated, each metal presents a particular colour. The spectra of gases are obtained by enclosing them in a highly rarefied state in glass tubes, and then passing the electric spark through them. They then glow with beautiful colour, and the light they emit may be examined by the spectroscope."—*The Scientific Record.*

ROYAL SOCIETY OF VICTORIA, AUSTRALIA.

At the monthly meeting of this Society, held in their hall, Latrobe Street, Victoria, on the 12th September, Professor Halford reminded the members of a promise he had made to renew the subject of his investigations into snake poisoning, and the action of the poison on the blood. Dr. Gummow, of Swan Hill, had sent him several specimens of the tiger snake, the most venomous of its species, and he had experimented upon the virus of one of them, which was made to bite a dog, from the effect of which the dog died in three hours. The quantity of maculated and neucleated cells which a microscopic examination showed had formed in the blood was something marvellous. They were as large and had all the distinctive characters of those found in blood of the man bitten by the cobra-dicapello at Tankard's Hotel. His investigations had convinced him that they were germinal foreign cells, and he had no doubt that the remedy to be provided was something that would check the growth of this foreign matter before it had reached an extreme; to put a stop, in short, to the fearful multiplication of foreign germinal cells. He promised to read a paper on the subject of his investigations at no distant date.

Professor M'Coy said he had witnessed the wonderful growth of the cells, and he compared the infusion of the

poison of the serpent into the blood to the introduction of the *fungi* of yeast into liquids, which rapidly permeated the whole system.

Dr. Thomas said he had witnessed similar corpuscles in the blood of persons affected with diphtheria and cutaneous abscesses, and in a dog which had died of distemper the neucleated corpuscles were visible. He had not, however, witnessed the maculated form distinguishing the poison of the serpent.

Professor Halford said the form and size of the corpuscles were of importance in distinguishing in these cases. He had no doubt the blood would be locally affected in the diseases mentioned, but not in the way described in his investigations.

Dr. Barker bore testimony to the great results likely to follow a pursuance of Professor Halford's inquiries.

Professor M'Coy gave a short explanation of the character of the wombat. He said it was supposed that there was only one species in Australia, known as the Tasmanian wombat, which was believed to be characteristic of the entire species to be found on the continent and elsewhere. His investigations had, however, convinced him that there were four distinct species. Two years ago a specimen of a curious wombat was sent him from South Australia, which, from its external character and internal anatomy, differed from all other wombats. In all ruminating animals, those which inhabit forests have a crooked or muffled snout, and the new specimen was deficient in the muffle possessed by the common wombat. Further inquiries had satisfied him of the existence of other species, to which names had been given. Professor M'Coy exhibited stuffed specimens of the various kinds, showing their peculiarities.

A vote of thanks to the chairman closed the proceedings.—*North British Agriculturist.*

Translations and Reviews of Continental Veterinary Journals.

By W. Ernes, M.R.C.V.S., London.

NOTES ON THE RINDERPEST.

By F. C. Hekmeyer, Professor at the Veterinary School of Utrecht.

(*Continued from* vol. xl, p. 991.)

Transmission of the Virus by the careless burying of the Dead Bodies, and the habit Cattle have of Smelling at them.

The careless manipulation of the carcasses, or the débris of

animals which have died of the rinderpest, has been more than once the cause of the propagation of this disease. Also the unpardonable neglect with which the débris of pestiferous animals have been left in the fields has been many times the cause of the spreading of the malady. Buniva says that in 1796 it was one of the causes of the propagation and progress of this epizootic. Batazzy reports that during the prevalence of the rinderpest in Piedmont, the environs of Pozzuolo were infected by a cow having smelt at the head of one which had died of the pest. Huzard, sen., reports that, in 1814, in the department of the Main, while burying a dead cow four healthy ones came and smelt at it, and they all soon after showed symptoms of the rinderpest.

Sad experience has demonstrated that the emanations from the dead bodies, when buried not sufficiently deep, are very dangerous, and become the hotbeds of the infection.

Vicq d'Azyr reports that at Mont-Real he inoculated muscular fibre taken from a carcass that had been interred above months, and the animals so inoculated took the disease.

Transmission of the Malady by the Hay, Straw, Grass, and Dung.

Alta (1765) believes that the hay from meadows which have been dressed with the manure containing contaminated débris from infected cattle is a frequent and powerful cause of infection.

Camper thought that infected forage could propagate the malady.

The rinderpest which prevailed in England in 1770 broke out at Pardsey, near Aberdeen, on the coast of Scotland, through being brought from Holland, where the epizootic prevailed, and which contained the propagating virus. Vicq d'Azyr gave an ox some hay with which another affected with the malady had been rubbed down, and the animal soon after was affected with the rinderpest. The other half of the wisp was carefully washed and cleansed and given to another ox; this remained healthy.

Buniva reports several instances of cattle having been attacked after eating the hay left by pest-stricken animals.

Huzard assures us that in 1815 many animals were infected after having eaten the forage left by diseased ones.

Haupt (p. 262) relates that a man complained of having lost all his cattle after having fed them on some hay which he had bought at a distance of thirty versts in a village where the malady prevailed.

Bojanus speaks of a cattle-breeder who, having bedded

down his cattle with the litter from infected sheds, had all of them attacked with the malady in one week.

Schrœckius assures us that the rinderpest which ravaged Germany in 1811 was brought to Augustburg by cattle from the infected prairies in Hungary.

De Berg (*Genees, natuer und huishoudk: Jaarboeken*, 1778, first part, p. 458) likewise believes that the contaminated meadows have a fatal influence in the propagation of the malady.

Engelman is much afraid of the influence of the manure from infected animals, therefore he would interdict the use of all manure and straw from infected sheds.

Alta, 1765, assures us that the ravages of the rinderpest are usually more severe in countries rich in abundance of vegetation, the cause of which is the use of manure contaminated by the virus.

In 1815 the malady broke out in the sheds of MM. Colette and Delrue because they had neglected to inter the dung from infected cattle. (Hurtrel d'Arboval.)

Spinola (*Mittheil*, 1846, p. 58) says that in 1844 the malady was introduced into Coczerzyn, in Poland, by infected forage bought by a countryman in a suburb of Lublin, where the malady then prevailed.

At Neckarrems and Unterturkheim animals were infected by passing over a heap of dung where diseased ones had passed before them.

The history of the epizootic at Rudesberg shows that even the vapour escaping from the dung is to be feared. In 1796 the epizootic had ceased for three weeks, when the dung was removed to be put on the land, and immediately after this the malady broke out afresh. (Holfacker.)

Doctor Zahn (*Vierteljahresschrift*, 1855, p. 5) reports that in 1854 the malady prevailed at Dolloplas, through the removal of dung from an infected district.

At Waarder, near Woerden, the malady manifested itself at the end of September, 1865, where manure had been brought from an infected district. A cowkeeper asserted that he had seen cows smelling at the manure so brought in, and the author says he could not attribute the malady to any other cause.

In 1773 the malady broke out at a farm soon after the farmer had allowed a cattle-dealer to depasture two cows in his meadows, and those cattle that afterwards went in the same meadow became infected. (Paulet.)

The sojourn of cattle in contaminated meadows caused the breaking out of the plague a second time at Aubin Saint-Bart and at Erquémicourt. (Hurtrel d'Arboval.)

At Lausanne a park of Hungarian oxen, for the provision of the army, were placed in a meadow where some other cattle were put afterwards, and these were soon decimated by the rinderpest. (Grognier, *Recueil*, 1832, p. 24.)

Transmission of the Virus by the Water.

Water becomes easily charged with the virus. Hence it happens that cattle, when they are allowed to drink from ponds impregnated with the emanations from infected animals, soon become attacked with the rinderpest. There is no less danger in watering healthy cattle at the same trough where infected ones have been watered.

At Mortara the malady was conveyed by a running stream in which infected cattle had been watered. (Buniva.)

At Sallugia the bodies of pestiferous cattle were thrown in a canal, and the malady broke out through the whole country traversed by this canal.

At Saint-Paul the inhabitants infected a source of water by throwing the bodies of cattle that had died of the rinderpest in it; and several oxen, drinking of the water, became affected by it.

Hurtrel d'Arboval relates that at the village of Samer the malady spread over the whole village through healthy cattle being watered at the same source with diseased ones.

Transmission of the Virus by Stables and Roads.

A stable that had been disinfected, but not whitewashed, retained the virus after four months. (Am-Pach.)

Hofacker reports that in 1810 ten oxen passed over some ground which diseased cattle had just left. These animals smelt at the ground, lowing at the same time. Six days after, they were all attacked by the rinderpest.

Veith assures us that it has been ascertained by numerous observations that cattle passing on roads where affected cattle have travelled rarely escape the infection.

Haupt knew a herd to become infected after having been in a field where, some time before, an animal having the malady had been.

Jollivet reports the following fact:—Three sick cows were to be slaughtered, but one of them was unable to reach the place where the hole was dug to bury them. She fell down in a field of clover, and was obliged to be conveyed in a cart. A short time after, three cows and a bull escaped from their conductors into the clover, some of which they ate. In eight days after, they were all four attacked by the rinderpest.

Garlach (*'Die Rinderpest in England, Hollland, und Belgiën*, 1865) quotes a striking example of the danger of allow-

ing cattle to travel on roads where infected cattle have travelled. At Halberstadt a herd of infected oxen only crossed the road; a little while after, some healthy animals came down the same road, and they all became infected in from five to six days after.

Bouley (*Recueil*, 1865, p. 600) says on a late journey in England he had seen a herd of cattle infected in a meadow, not far from the high road on which infected cattle travelled, without, however, coming in contact with them. I have myself quoted in the foregoing an instance of the transmission of the virus by the air.

Transmission of the Virus by other Species of Animals, as Birds, Insects, &c.

Two horses, coming from Castagnola, a very extensive country, introduced the malady into Vigan. The same thing was observed to take place in different other districts. (Buniva.)

In 1711 Laurisi, in a letter to Valisneri, has mentioned this mode of transmission. Camper likewise thought that it was necessary to beware of dogs and cats, as he considered that they often carried the virus from one place to another. Dufot relates the following on this subject. The dog of a cultivator of Morcourt followed some servants who went on horseback to Fonsomme, another village. On a farm where all the cattle had perished from rinderpest, the dog stopped to scratch up some remains of the dead cattle, on which he gorged himself; he returned to his quarters. Being thirsty, he was seen to lap at the pail out of which the calves had to drink, and also to roll himself on the straw and dung. A short time after, the calves were attacked with rinderpest and died; the malady next spread to the cows, and invaded the cattle of the whole village.

Vicy d'Azyr reports the following observation:—A dog belonging to an inhabitant of Andruiq-en-Artois, returned home after having strayed away for three days. He was seen covered with blood, and no doubt existed but that he had been feeding on the flesh of dead animals. On being driven out of the stable where he had taken refuge he passed between, and came into violent contact with, the legs of a cow placed near the door. A short time after, the cow showed all the symptoms of the rinderpest, and the whole of the cattle became infected and devastated by the pest.

Buniva states that dogs scratch up the dead bodies of pestiferous animals, and thus contribute to the spreading of it. Of this he knew many instances. At Mangrano the malady

was introduced by the dog of a veterinary surgeon. Sporting dogs transmitted the malady at Leghorn.

Bojanas also says that dogs, cats, and sheep might become the conveyers of the malady.

Eckel (*Vierteljahesschrift*, 1851, p. 18) reports that the pest was introduced into Joki (Austria) by dogs.

According to Buniva, the villages of Revello, Carmagnola, and Avigliana were infected by sheep. It was observed that at the time when the sheep leave the plains of Piedmont for the mountains, several of these flocks infected all the places through which they passed.

Engelman (*Verhand. Aitg. door de Holl. Maatsch. van Wetenschappen*, 1763, 7th ed., p. 262) says it is not without danger to allow sheep and goats into contaminated sheds or meadows, because these animals may become infected with the rinderpest, or at least the virus might be carried in the wool and hairs, and thus be transmitted to the cattle.

Haupt ascertained that a shed of cattle were infected by a goat.

In the opinion of Pauli (*Die Rinderpest im Sommer*, 1863; Johannisberg, 1864) the most dangerous propagators of the contagion were the sheep, because the virus easily hangs in their wool.

Maresch considered the rinderpest which was introduced in Sedlec, in Bohemia, to be by sheep (*Vierteljahresschrift*, 1863, t. xix, p. 59).

Buniva, in his treatise on the maladies of cats, has shown that these animals could carry the contagion a long distance.

Dr. Bicker writes, in the *Journal of Rotterdam* (Aug. 22, 1769), that the virus of the rinderpest "might be propagated in different ways, even by the flies."

Buniva has collected several instances which prove that birds of prey may carry the malady from the débris of the dead bodies on which they feed. Crows, also, and other species of birds which are frequently seen on cows' backs, may transmit the disease, by the virus adhering to their feet, beak, and feathers; and thus it may be conveyed to some distance.

The anonymous author of the 'Observations on the Report of Professor S. J. Brugmans,' 1797, p. 55, considers that the rinderpest virus may be transmitted by the large flies which he found in great numbers on the dead bodies of those animals that had died of the malady; and even by those which alight on the head and round the nostrils of the living affected animals.

Buniva and Dr. Razeri have remarked that the common fly, and many other insects, might become the means of spreading the virus.

Heilbron believes that dogs, cats, poultry and flies are capable of being the carriers of the poison. Veith includes rats, mice, and rabbits.

Transmission of the Virus by the Wind.

In 1814 Professor Viborg was convinced that the virulent elements of the malady had been transmitted by an easterly wind to the cattle of a farmer at Scharrenhagen (Schleswig-Holstein), who had driven his cattle to a pond to water them whilst the cattle of a neighbouring farmer, which had died from the pest, were being buried (*Gurlt und Hertwig Mag.*, p. 45).

At Pohnsdorf, Viborg observed, in 1814, that the contagious miasma extended only to about thirty metres against the wind (*Ibid.*, p. 45).

It would be idle to demonstrate the transmission of the virus by actual contact. The following observation will show that the instantaneous contact of an infected animal will suffice to transmit the malady to a healthy one :—A cultivator, Kok by name, inhabited an isolated farm in the neighbourhood of Waardingen. He was in great fear of the plague, and consequently lived very secluded with his family and servants. However, in September, 1865, one of his cows caught the malady. By the advice of his bailiff, he had sent this cow to a bull at the distance of a league from his farm (Cinq-écluses, near Schiedam), and the cow was brought back without loss of time, and on arriving at the farm was carefully kept separate. After a few days, however, the symptoms of the plague declared themselves in the cow. How was the infection introduced? Besides the bull in question there was, at the same place, a young bull, bought on the 5th of August at the fair of Rotterdam, after having been standing next to the bull. This young animal had died of the pest a few days after its arrival, a day or two before the cow was brought there; and eight days after the cow had been there, the bull also became affected, but he recovered. It was, therefore, the latter who was the bearer of the virus taken from his young companion, who had transmitted it to the cow in the act of coition.

ROYAL COLLEGE OF VETERINARY SURGEONS.

At a meeting of the Court of Examiners of the Royal College of Veterinary Surgeons, held on December 18th, the following students from the Royal Veterinary College, London, passed their examination and received the diploma of the College viz.:—Messrs. George William Osborne, Fulston, South Lincolnshire; William John Mulvey, London; William Dunk Rogerson, Bedford; Contsant Cornelius Sanderson, London; William Maynard, Romsey, Hants; and Albert François Florens, Port Louis, Mauritius.

In addition to the above, the following gentlemen were examined on the same day before the special board of examiners, and were admitted members of the body corporate, viz.:—Messrs. John Mills, 18th Hussars, Secundrabad; James Collins, Inspecting Veterinary Surgeon, Poona, Bombay; and Samuel Wagstaff, Girton, Newark.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

The annual meeting of the Society was held at noon on Wednesday, in Hanover Square. The chair was filled by the President, His Grace the Duke of Richmond. The attendance was very small.

The Secretary (*Mr. Hall Dare*) read the following Report of the Committee:—"Since the last general meeting in May, 1 governor and 97 members have died, and 177 new members have been elected, so that the Society now consists of 76 life governors, 82 annual governors, 1383 life members, 4001 annual members, and 15 honorary members, making a total of 5557. Mr. John Baldwin, of Luddington, Stratford-on-Avon, Warwickshire, has been elected a member of Council in the room of Mr. Pope, deceased. The half-yearly statement of accounts to the 30th of June, 1867, has been examined and approved by the auditors and accountants of the Society, and has been furnished to all members in the last number of the Journal. In consequence of the large expenses attendant on the show at Bury St. Edmund's, and the protracted trials of implements, the Council has been compelled to sell out £2000 of the funded property, which now stands at £16,027 19s. 7d., in the New Three per Cents., and the cash balance in the hands of the bankers on the 1st instant was £369 8s. 1d. The collection of the arrears of

subscription has been steadily progressing; nevertheless, a considerable sum is still due to the Society. It is found that many members cease to pay their subscriptions under the impression that in this way they can terminate their membership; but the Council desire to remind them that by the bye-laws of the Society all members are bound to pay the annual subscription until they shall withdraw by a notice in writing to the Secretary. Notwithstanding the unavoidable absence of cattle, the show-yard at Bury St. Edmund's was well filled with a fine display of horses, sheep, pigs, and poultry, and was remarkable for the most extensive collection of implements and machinery yet brought together. The mayor and corporation of Bury St. Edmund's and the local committee used every exertion to forward the wishes of the Society during the preparations for the meeting and the period of holding it. The Council have purchased an entirely new set of offices and entrances for the show-yard at a cost of £806, which it is hoped will last for many years. They have reason to be satisfied with the new contractor for the show-yard works (Mr. Penny), and have given him the contract for a further term of four years. The Council have settled the live stock and implement prize sheets for the country meeting to be held next year at Leicester, and, with a view of enabling the stock and the men in charge to return home with an absence of only one Sunday, have arranged that the show shall open on Thursday, the 16th, and close on Tuesday, the 21st of July. The list of implements for trial will comprise ploughs, cultivators, harrows, clod-crushers, rollers, tile and brick machines, and draining tools; and prizes amounting to £225 will be offered for the best application of steam power to the cultivation of the soil. The sum of £2595 is offered in prizes for live stock, to which £227 has been added by the Leicestershire and Waltham, and the Loughborough Agricultural Societies; and £100 has been offered by the Sparkenhoe Farmers' Club in prizes for cheese. It has been resolved by the Council to apportion England and Wales into eight districts, as follows:

"A. Durham, Northumberland, and North and East Ridings of Yorkshire.

B. Cumberland, Lancashire, Westmoreland, and West Riding of Yorkshire.

C. Derbyshire, Leicestershire, Lincolnshire, Northamptonshire, Nottinghamshire, Rutlandshire, and Warwickshire.

D. Bedfordshire, Cambridgeshire, Essex, Hertfordshire, Huntingdonshire, Norfolk, and Suffolk.

E. Berkshire, Buckinghamshire, Hampshire, Kent, Middlesex, Oxfordshire, Surrey, and Sussex.
F. Cornwall, Devonshire, Dorsetshire, Somersetshire, and Wiltshire.
G. Gloucestershire, Herefordshire, Monmouthshire, Worcestershire, and South Wales.
H. Cheshire, Shropshire, Staffordshire, and North Wales.

"The Council have determined that district B, comprising the counties of Cumberland, Lancashire, Westmoreland, and the West Riding of Yorkshire, be selected for the country meeting of 1869. During the course of this year alterations have been made in the scheme of education adopted by the Council; it is no longer connected with the Cambridge and Oxford Middle-class examinations. The next examination is fixed to take place at the Society's house, iu Hanover Square, during the week commencing April 20th, 1868. Forms of entry are prepared to be duly filled up and returned to the Secretary (together with a certificate of having acquired the elements of general education) on or before the 29th of February next. Any member of the Society may be present at an examination. On this occasion it is not thought advisable to place any limit on the ages of candidates, from the desire to remove every obstacle in the first instance to a candidate coming forward; with the same object in view, an unsuccessful candidate at one examination (unless some reason should intervene beyond mere want of success) will be permitted to compete at a subsequent examination. Every candidate will be required to satisfy the examiners as to his knowledge of the science and practice of agriculture, and likewise as to proficiency in book-keeping, and he must pass an examination either in land-surveying, or in mechanics as applied to agriculture; beyond this it is left to his option which one of the following three subjects he will take up, viz. botany, geology, or veterinary science. Successful candidates are to be placed in two classes, and will stand in order of merit. Certificates (specifying the subject in which a candidate shall have satisfied the examiners) will be granted to successful candidates; and any one obtaining a first-class certificate shall thereby become a life member of the Society: these, with additional prizes, in money or books, constitute the rewards held out to competitors."

Mr. S. Sidney proposed the adoption of the report. He did so with very great pleasure, as it showed, considering the difficult circumstances in which the Society had been placed, satisfactory progress in an institution of great importance to the country. After passing in review the several

matters alluded to by the Council, Mr. Sidney concluded his remarks by observing that he perceived that the new arrangement of districts which had been adopted was not merely a geographical but also a geological one, and in his opinion would tend to give greater importance to the country meetings than had ever yet attached to them.

Mr. Neild seconded the motion.

The report was unanimously adopted.

General Hood moved, and *Colonel Challoner* seconded, the re-election of the auditors, Mr. Astbury, Mr. Corbet, and Mr. Sherborn. A vote of thanks was also accorded to them for their services during the past year.

The routine business having been disposed of,

His Grace, in conformity with custom on such occasions, inquired whether any member desired to make any remarks or suggestions.

Mr. Arkell said he was glad to hear that there were rather more members than there were a year ago. Still it could not be concealed that the Society was almost stationary, and though he had no intention to utter anything offensive towards the Council, he must say that, in his opinion, the cause of that was that they did not keep pace with the times. (Hear, hear.) In the first place there was one or two gaps requiring to be filled up. They had Dr. Voelcker filling one important post, and Professor Simonds another, and the latter gentleman had been very useful in reference to cattle plague. But there were other diseases to be investigated besides cattle plague. There were the diseases of plants, and he would instance, as seriously affecting his own neighbourhood, the diseases among swedes and common turnips. He thought there should be a Professor of Natural History paid by the Society, to inquire into the origin of diseases in plants, and to ascertain whether they were caused by blight, mildew, or insects. The disease to which he had alluded existed to a considerable extent in the West of England. It had done a great deal of mischief in his own county of Wilts; but he had also seen it in Gloucestershire, on the Cotswold Hills and elsewhere. He had been engaged in farming for about thirty years, and at that period they never scarcely heard of any disease in mangold. Of late years there had been an insect winding itself between the leaves of the plant. It was not the old turnip-fly, or anything like the turnip-fly, in the swede. It appeared to him that in the case of all foreign plants introduced into this country there was some sort of counteracting influence checking production, whether it arose from the soil, from blight,

or from insects, which required to be watched by a scientific man, who ought in his opinion to be paid for his services by that Society. A gentleman from London who walked over his farm attributed the disease to the use of artificial manure; but he (Mr. Arkell) did not concur in that opinion. He had sometimes found a sort of chrysalis or grub in the centre. On minute examination it was found that the seed-stalk was dead, and that appeared to affect the whole of the plant. Sometimes he could not find the grub, but, nevertheless, the plant went into curl, and growth was quite stopped. On looking over the articles in the commencement of the Journal, he found some written by a gentleman named Curtis upon that subject. He did not know whether Mr. Curtis was alive or dead. [The Secretary: Dead.] Since 1842 or 1843 nothing had been said in the Journal about these diseases. Mr. Arkell concluded by referring to two articles relating to this subject, which, he said, appeared in the 'Agricultural Gazette' of the 7th of last September.

Mr. Sidney desired once more to call the attention of the Council to the importance of undertaking an agricultural survey of England and Wales. Of course he could not expect the Council to take up the work off hand, and without giving it due consideration; but he had no doubt that a day would arrive, and that not distant, when some president of the Society would gain a just reputation by advocating the institution of such a survey. It was thirty years since the Society was first established, yet he defied any one to point out a single book or essay which would give an adequate idea of the improvement made in the agriculture of England since the day the Society was founded to the present moment. They were told that they only numbered 5000 members, but surely among 5000 men of the class who constituted the Royal Agricultural Society they had a sufficient proportion of practical men—tenant farmers and others—to return intelligible answers to plain and intelligible questions on this interesting subject. He would suggest, therefore, that the Council should divide itself into committees—one for the chemical department of the inquiry, assisted by Dr. Voelcker, and another the veterinary department, aided by Professor Simonds. The necessary questions with regard to live stock, and the necessary questions as to cultivation, might then be prepared and forwarded by the most eminent breeders of stock and cultivators of the soil throughout England and Wales, with a request that they would fill in the answers to to the questions, and return the forms so completed to the Council. The questions would go to this point: What they

were doing now, and what they were doing thirty years ago; and the replies to these queries would afford a valuable mass of information, of which the Society hardly possessed a shred at this moment. It might be objected that this would be an expensive process; but even if it were so, and they found themselves obliged to sell out a further portion of their invested capital, the result would be to place the Society in a still higher position than it ever before occupied in carrying out its motto of "practice with science."

Colonel Challoner wished to remind Mr. Sidney that the Council had not altogether overlooked this subject, and the prizes given by this Society had drawn forth much information respecting the state of agriculture in the different counties. He should be sorry if it went forth that the Council had been inattentive on that point.

Mr. Sidney observed that he did not want professional essays—he did not want essays which were written for five or ten guineas, but he wanted the information of men who really understood the matter.

Mr. C. S. Read, M.P., said, as a young member of a very sleepy Council (laughter), he could assure Mr. Arkell that the Council had cause to complain of apathy and indifference on the part of members of that Society. There they had in that room what number of members? About fifty out of 5000. (Hear, hear.) If Mr. Arkell and other gentlemen would lend the Council their assistance by suggesting subjects for prize essays the suggestions would be received with thankfulness, and might be productive of a great deal of good. He could not doubt that what had been said with respect to curl in the turnip would receive the attention of the Committee. As regarded the disease in mangold to which Mr. Arkell alluded, he (Mr. Read) might remark that if that gentleman turned to the papers of Mr. Curtis he would find that disease minutely described. He would also see a remedy suggested; but, unfortunately, remedies of that kind were not always practicable. If he remembered rightly, the remedy suggested in that case was that farmers should employ a number of women and children to go round their fields and pinch these unfortunate maggots (laughter); but as they were now deprived to a great extent of that kind of labour, of course the suggestion could not be carried out.

Major-General Hood had no doubt the Council would feel much obliged to Mr. Sidney for his suggestions; but he would remind the meeting that the essays relating to the agriculture of the several counties were nearly completed, and it would be for the Council to consider the advisability

of proceeding further. The country had been divided into ten districts, and the Society used to go into one of them every year. It had now been divided more geologically, and therefore, as he thought, more scientifically, into eight districts, and it would be for the Council to consider whether a certain amount should be voted annually for a special report, each district being reported upon separately. As regarded the finances of the Society, he begged to say, as chairman of the Finance Committee, that he was sorry they were obliged to recommend the Council to withdraw £2000 for Bury. But he always foresaw that that would be the result if the Society determined to go to a small town. Nevertheless, it must always be recollected that they should not think too much of money (hear, hear), and must go where it was considered best for agriculture that it should go. (Hear, hear.) He hoped that the funds of the Society would be reimbursed by the visit to Lancashire.

Mr. Warry thought that it was not only desirable that the necessary knowledge should be conveyed in the pages of the various publications, but that it should be brought home to the experience of farmers, so that practical effects might result.

The Chairman said there did not seem to be any practical question placed before the meeting by Mr. Arkell, but he thought he might say, on behalf of the Council, that they were anxious at all times to receive suggestions from members of the Society; they were most ready to pay attention to suggestions coming from practical men, and if possible to arrive at a useful result. There was one thing mentioned by Mr. Sidney which he feared the Council, however active they might be, would find quite beyond their power; he did not see how they were to compel people to read the Journal. (Laughter.) By Mr. Sidney's own admission, the Journal was a very well-conducted periodical, and was written with great ability and skill; but that gentleman's complaint was that information was offered by that Society, but persons would not read it. Well, if this was the case—and he did not question Mr. Sidney's assertion—he must say that was the fault of the public outside, and not of the Council inside. If gentlemen would take the trouble to examine they would find various treatises on the diseases of turnips. Under these circumstances it was, he thought, rather hard that the complaint should be made against the members of the Council that they had not read the two newspaper articles which appeared in September last. He was quite sure, however, that the more suggestions were made by practical men like Mr.

Arkell, the better pleased the Council would be, and the better it would be for the public generally. It was only from practical quarters, from gentlemen who were engaged in farming, that the Council could ascertain what was really wanted; and it was of course very desirable that the diseases of cattle and plants should be discussed at such meetings as that. At the same time, he did not think that they were quite so deficient in knowledge on those subjects as Mr. Arkell's remarks would lead any one to suppose. He admitted the value of Mr. Sidney's suggestions as to getting the country better divided, with the view of obtaining reports from different districts. But he must remind that gentleman that on no subject was there so much difference of opinion among practical farmers as on that of agricultural statistics. (Hear, hear.) For his own part he thought there was undue apprehension on the part of men who did not go sufficiently deep into that question, or who did not look far enough before them. He thought that agricultural statistics would be very valuable. In connection with the office in the Government which he had now the honour to preside over, he had endeavoured last year and this year to secure something like a collection of statistics. Of course the thing was only permissive, and therefore they could not expect to obtain exact information; but if agriculturists generally were thus led to inquire and to value statistics, they would probably be led to assist more readily than they had done hitherto. There existed a strong feeling, an ignorant feeling as he thought, in many quarters, in reference to the collection of statistics; and it was only by degrees that prejudice could be removed, and an object secured which he believed would confer benefit on farmers as well as on the public generally. He would only add that he had been endeavouring to draw up some papers with the view of securing returns, and that he hoped he should meet with the support of farmers generally; for he was quite sure that unless they did support him it would be perfectly useless to attempt to collect statistics.

Mr. Willson (Leicester), after suggesting that at future country meetings, the meeting of members should be held early in the week, in order to ensure a better attendance, said he believed the unwillingness to make returns was in a great degree owing to the refusal of the Government to deal with foreign stock, and he believed that no returns would be made unless the Bill that had been introduced dealt with that question in a fair spirit. He did not, he might add, consider that the papers sent out by the Lords of the Privy Council were in the best form for the purpose.

Mr. A. Pell said he rose to move a vote of thanks to their noble chairman. (Cheers.) He need say very little on that subject, his Grace's name and that of his family being entirely and thoroughly associated with the welfare and progress of agriculture. (Cheers.) The noble duke and his immediate predecessor were indeed so successful in that department, that he was quite sure that, even if that were the commencement of his Grace's term of office, instead of the middle, the proposal would be received with the utmost cordiality.

Colonel Challoner said, as one of the oldest members of the Council, he felt great pleasure in seconding the motion; and he would remark that, notwithstanding his Grace's official duties as a member of the Cabinet, he did not believe there was a single instance in which he had failed to take the chair at a Council meeting since he had become president. (Cheers.)

The motion having been carried by acclamation,

The Chairman, in returning thanks, said the gentleman who proposed the vote of thanks truly observed that he and his family had been connected for a long time with agriculture. He added that they had been most successful. On the present occasion that was an unfortunate remark (laughter), because it happened that that was the first time for very many years that his father or himself had not taken one of the prizes at the Smithfield Show. He would not enter into the merits or demerits of that exhibition, which he would probably in a few hours have to descant upon in the neighbourhood of Fleet Street. He could not help saying that one remark of a gentleman who had just spoken bore out what he (the chairman) had said with regard to the difficulty of collecting agricultural statistics. That gentleman said in effect that farmers would not aid the Government in the collection of statistics, unless foreign cattle were slaughtered at the ports. Now, he could not conceive two things less connected with each other. (Hear, hear.) Why they were not to get one thing done if they could not get another thing done, which had nothing to do with it, he could not understand. (Hear, hear.) Such conduct appeared to him very short-sighted. He recollected hearing an intelligent practical farmer say, some years ago, at a meeting of a Board of Guardians, that he was not going to fill up returns, because the Government would not repeal the malt-tax. (Laughter.) He had great hopes, however, that the Bill of the Governmeut relating to foreign cattle would be passed. He hoped it would provide for the slaughtering of animals

at the ports, for without that they could not be satisfied. (Cheers.) He was now speaking not as a member of the Cabinet, but as a large flockmaster. He hoped that sheep would be slaughtered at the ports. He should be very sorry if the disease were imported into this country, which would be a very serious evil to flockmasters and to agriculturists generally who dealt much in sheep. (Hear, hear.) He would not detain them further; but he thanked them most cordially for the honour they had done him, and he could state that the time which he had devoted to the business of that Society had been to him a source of great pleasure. (Cheers.)

The meeting then separated.

NORTH OF ENGLAND VETERINARY MEDICAL ASSOCIATION.

THE sixteenth quarterly meeting of this Association was held at Mr. Donald's Hotel, Newcastle-on-Tyne, on Friday, October 18th, 1867. The members present were—Messrs. C. Stephenson, President; D. Dudgeon, T. Foreman, L. Scott, W. S. Moore, A. Man, jun., R. Brydon, — Gofton, D. McGregor, C. Hunting, and the Honorary Secretary.

Letters were read from Messrs. Marshall, of Glanton, and Womack, of Ponteland, regretting their inability to attend.

Mr. Meikle was proposed as a member by *Mr. C. Stephenson*, seconded by *Mr. Scott*, and carried unanimously.

The election of office-bearers was then proceeded with. *Mr. Dudgeon* proposed, and *Mr. H. Hunter* seconded, that Mr. C. Hunting be elected President for the ensuing year.—Carried unanimously.

Mr. C. Stephenson then vacated the chair, in favour of Mr. C. Hunting.

Mr. Dudgeon proposed a vote of thanks to Mr. C. Stephenson for the able manner in which he had filled the Presidental chair, which was seconded by *Mr. Brydon*, and supported by *Mr. C. Hunting*, and carried unanimously.

Mr. C. Stephenson, in acknowledging the compliment paid him, stated that he certainly had taken some interest both in the Association and the profession, and he must say that he had derived great benefit from having been a member of this Association, having learned many things during the debates which otherwise he would not have known.

It was proposed by *Mr. McGregor*, and seconded by *Mr. C. Stephenson*, that Mr. Dudgeon be elected a Vice-President.—Carried.

Proposed by *Mr. W. S. Moore*, and seconded by *Mr. Foreman*, that Mr. Scott be re-elected a Vice-President.—Carried.

Proposed by *Mr. C. Stephenson*, and seconded by *Mr. McGregor*, that Mr. Dudgeon be retained as Treasurer.—Carried.

Proposed by *Mr. McGregor*, that Mr. H. Hunter be elected Secretary; seconded by *Mr. Brydon*, and carried.

Proposed by *Mr. Dudgeon*, and seconded by *Mr. Brydon*, that Messrs. C. Stephenson, Wilkinson, Foreman, Moore, Gofton, and McGregor, be Councilmen for the ensuing year.—Carried.

It was also arranged that the next meeting be held on the third Friday in January, at two o'clock in the afternoon, and the dinner at four p.m.; the President, Honorary Secretary, and Council to make the necessary arrangements for the same.

Mr. Brydon then read his paper "On Veterinary Surgery and the Allied Sciences," which is subjoined. It was listened to with great attention, and elicited some discussion.

Mr. C. Hunting thought that all present would agree as to the importance of the subject introduced. He could speak more especially as to the former part of the paper, with respect to agriculture and the system of contracts, for he considered that immense influence would be obtained by the veterinary surgeon, if he could show to the agriculturist that he was well versed in that science. He also said that he could speak favorably of the system of contracts, and likewise of the importance of chemistry in relation to veterinary medicine governing the proper admixture and administration of drugs, and he begged to propose a cordial vote of thanks to Mr. Brydon for his very able paper, which was seconded by *Mr. Scott*, and carried unanimously.

Mr. C. Stephenson disagreed with the President as to the advisability of contracts, as he considered the system neither satisfactory nor just, and thought it was better to charge for what was done, and also for advice. He also disagreed with the practice of sending out merely coloured or scented solutions for the purpose of charging for the same.

Mr. C. Hunting considered that where there was a contract you would be in a better position to act, and by your advice would be able often to prevent disease, so that your employer would be better satisfied to pay you, although you had not been required to treat any active disease; yet by comparing his loss by diseases in former years, and which by your advice had been prevented, he would find it to his advantage.

Mr. Dudgeon considered with the President that it rather tended to raise the profession, by entering into contracts, for he found that generally you stood better in the estimation of your employers, and were consulted by them more frequently with respect to diet and other things.

Mr. Gofton agreed as to the desirability of contracts, and thought that the reason why attacks were not so fatal where contracts existed as otherwise arose at your being called in at the onset of the disease.

Mr. C. Stephenson thought that if your employers had confidence

in you, they would send for you at once, whether there was a contract or not.

Mr. H. Hunter also believed that the chief advantage was that you would be called in to cases earlier.

Mr. Dudgeon said he uuderstood that the President considered the chief advantage to be, that you were in a better position to give advice and to do good to your clients.

Mr. C. Stephenson thought there was a danger of the veterinary surgeon not doing his duty so well when there was a contract, and considered it better to charge for your professional advice.

Mr. Brydon stated that all Mr. Hunting's clients who contracted were more satisfied than those who did not. Moreover, there was not the danger of your employer turning round and saying that the animal which you may have been treating was not worth the charge you made.

It was proposed by *Mr. C. Stephenson,* that Mr. Brydon's paper be sent for publication to the *Veterinarian.* He said that it had been a great pleasure to him to listen to so able a paper, and thought there was no fear of the profession retrograding, so long as we could produce a writer of such an essay. It was seconded by *Mr. McGregor,* and carried unanimously.

The President handed a paper to the Secretary to read to the meeting, which he had received from Professor Armitage, relating to the proposed Veterinary Charter for Scotland, Veterinary Education, &c.

With respect to the granting of a separate Charter for Scotland, it was unanimously thought that, however many schools there might be, there should be only one Examining Board.

Proposed by *Mr. C. Stephenson,* and resolved, that the following petition be sent to the Honorable the Board of Trade, against the granting of a Charter for Scotland, and that the President sign it on behalf of this meeting. Seconded by *Mr. Dudgeon,* and carried unanimously:

To the Honorable the Board of Trade.

The humble Petition of the North of England Veterinary Medical Association sheweth,—That your Petitioners view with anxiety the granting of a separate Veterinary Charter for Scotland, and legalising Boards of Examiners, and that for the following reasons:—1st. It would not confer any benefit upon Scotch students which they do not already possess. 2nd. Because it is exceedingly objectionable for any teaching school to have the power in the appointment of an examining board for its own students, as it is to the interest of the school to pass as many students as possible; whereas the interest of the country requires better educated men, rather than an increase of numbers; and this important requirement can be best obtained by the examining boards being independent of the teaching schools. 3rd. The working of the present Charter is complete and satisfactory, being entirely independent of all the teaching schools; the latter are all on an equal footing toward it, and the Scotch students incur no more trouble or expense in obtaining the diploma

than the students in London or elsewhere, as they have the privilege of being examined by the Scotch section of the Board of Examiners. 4th. A rivalry between the different teaching schools as to which will turn out the best qualified men is very beneficial in its action; but a rivalry between bodies conferring similar degrees has quite a contrary effect. Your Petitioners, therefore, earnestly pray that your Honorable Board will reject said application. And your Petitioners, as in duty bound, will ever pray.

Signed in behalf of the Members,

CHARLES HUNTING, *President.*

A cordial vote of thanks to the President closed the proceedings.

H. HUNTER, *Hon. Sec.*

ON VETERINARY SURGERY AND THE ALLIED SCIENCES.

By R. BRYDON, Pensher.

(*Read at the Meeting of the North of England Veterinary Medical Association.*)

FROM the title of the paper you may naturally infer that you are going to hear something very extensive and scientific; but you need not be alarmed in the one case or disappointed in the other, for you will get neither from me.

The full consideration of the relations which all the sciences bear to veterinary surgery would require time and space far greater than I can command, to say nothing of a knowledge far beyond what I possess. I have contented myself by merely selecting a few of those sciences having practically the most useful bearing on our profession, leaving out many others which, though indirectly of vast importance, do not so immediately concern us in the discharge of our professional duties.

I will first take up those sciences with which we are more immediately connected, and dwell on their relations to veterinary surgery at considerable length; then devote the time remaining to the others which practically are to veterinary surgeons of lesser importance, and conclude with a few general observations on all.

Agriculture being the science with which we are most intimately connected, I will take up its consideration first.

At present the relation subsisting between agriculturists and veterinary surgeons is in a very unsatisfactory condition. The respective interests of the two parties are diametrically opposed; what pays the one impoverishes the other, and *vice versâ*; and instead of enjoying the confidence and good fellowship of the farmers, we are looked upon by them as a sort of necessary evil. To discover the reason and name the remedy for this unhealthy state of matters, it is necessary that we look at the relation of veterinary surgery to agriculture, from three different aspects, namely—1st, As it has been in the past; 2nd, As it exists now; and 3rd, As it may be in the future. First, then, as it has been in the past. Here by the past I mean to refer no farther back than the commencement of the present century. At that time qualified veterinary surgeons were few and far between, and they generally settled down in the large towns,

so that the farmers' interests were mostly looked after by the farrier and cowleech. In those days, comparatively few cattle were in the country, and those of hardy native breeds little subject to disease, except when placed under circumstances where they were grossly mismanaged. When disease did occur, the ignorant farmer sent for the more ignorant cowleech, who put the poor animal through his usual routine of treatment, which in many cases was far worse than the disease it was intended to cure. It is here worthy of remark, that the farmers of that time placed in those men, brutal and ignorant as they were, a confidence far greater than that generally bestowed on the veterinary surgeons of the present day. In process of time the farrier and cowleech were in part replaced by veterinary surgeons, and this not a bit too soon, as the more artificial system of feeding now introduced, coupled with housing in badly ventilated sheds, gave rise to many diseases hitherto unknown, to cope with which required all the superior knowledge and skill of the veterinarian. As time wore on, a better educated and less prejudiced class of farmers occupied the holdings of their forefathers, and ventilation and the requirements of the domestic animals being better understood and attended to, many diseases disappeared and would probably in the present day have reached a minimum, had not counteracting agencies been at work. What these agencies are I will, perhaps, better explain by stating their results at the present day. This will bring me to the second aspect from which I proposed to look at the subject, namely, the relation of veterinary surgery to agriculture as it now exists.

During the last thirty years agriculture has perhaps made more rapid progress than it ever did before in a similar time. But all parts of the country are not equally advanced, some counties being as far behind still as others were twenty years ago. This is principally owing to the size of the holdings, and the way they are let. If the farms are large, and let on leases of, say nineteen years, good management is generally the result. If, on the other hand, the farms are small and taken from year to year, the reverse is almost invariably the case. The explanation is easy. The large farms are available only to men of capital, who have generally in addition a good education, and, by exercising the latter in the outlay of the former, rapid improvement is the result. Again, the small farms are generally taken by men of small means and less education, and the uncertainty of their tenure makes them averse to lay out any money for improvement, the benefit of which might, in all probability, be reaped by another; for the same reason they take less interest in the sanitary condition and repair of the farm buildings. Their operations are performed in the most slovenly style, and the consequence of all is the invasion of many diseases, from which the animals on well-managed farms are exempt. Cases of colic, stomach staggers, and other diseases, arising from errors in the diet, are of constant occurrence. Cases of catarrh or bronchitis (from the animal standing in draughts or in hot, badly-ventilated houses), are frequent visitors, or it may be peritonitis or tetanus, from undue exposure to

wet and cold or nephritis or diabetis from eating musty hay, or mange green thrush from being kept in a filthy condition; or in cattle you might have hoven ferdelbrund, or red water, and other diseases too numerous to mention, but all the result of ignorance and neglect. In contradistinction to a district with farms like this, let us take another where the farmers generally are well educated, many of them having had the advantage of a college education, with a course of lectures on veterinary subjects included. This is assuming no more than what in reality is the case in many of the higher-farmed districts in the country. The Highland and Agricultural Society have obtained a charter for granting a diploma to those who pass an examination in all the sciences connected with agriculture. A similar diploma is granted by the Royal Agricultural College at Cirencester, and in the examinations for both a general knowledge of the principles of veterinary surgery and an acquaintance with the most common diseases is included, and ignorance on this subject alone is enough to reject a candidate. The number who pass these examinations yearly increase. They receive the necessary qualification either at our agricultural colleges, or by selecting and attending appropriate classes at our universities and veterinary colleges. This in great measure accounts for the considerable sprinkling of agricultural students usually found in our veterinary schools. They do not go there for the purpose of learning to do without veterinary surgeons as some are narrow-minded enough to suppose. So far from this being the case, these are the very men who usually turn out the veterinary surgeons' best friends. These are the men who can understand and appreciate the application of preventive measures. They also know the many diseases to which animals are liable and the dangers of delay, and though in cases of emergency they might use such curative agents as their knowledge would indicate, yet they never would trust to these alone, but would always call in the man who is trained by the experience of daily practice. And even supposing some are foolhardy enough to imagine they can treat their own animals, it would be no disadvantage to us, as in their inexperience they would be sure to make some mistake, and probably do more harm than good, and to put matters right, professional advice would have to be sought at last. But to revert to the subject. In a district with educated farmers, such as I have described, all the most recent improvements and discoveries in agriculture are put into force. The farm buildings for the accommodation of stock are commodious, well ventilated, and generally kept in the best sanitary condition. For the sake of clearness in comparing the two districts, let us call this one B, and the one formerly described A. As may be supposed, a far less per centage of disease would prevail in a district like B than in one such as A. In B all the diseases, the result of bad management, would rarely, if ever, occur; instead there would be diseases of an entirely different type, brought on by carrying to too great a pitch the mania for breeding and feeding so prevalent at the present day.

(*To be continued.*)

THE LANCASHIRE VETERINARY MEDICAL ASSOCIATION.

THE members of the above Association held their twenty-first quarterly meeting at the Royal Institution, Mosely Street, Manchester, on the evening of December 4, 1867.

The President, James Howel, Esq., in the chair.

The meeting was well attended, and after the transaction of a little preliminary business the President called upon Mr. A. L. Gibson to read his Essay upon "Pleuro-Pneumonia in the Horse."

The paper was a very excellent one, and the subject treated by Mr. Gibson in a sound and practical manner.

The discussion was opened by *Mr. P. Taylor*, who clearly and lucidly supported the opinion enunciated by the essayist, viz.: That there were two kinds of pleuro-pneumonia—pleuro-pneumonia proper, or of the acute character; and a specific affection, in which the lesions were apparently the same; the disease arising from a poisoned condition of the blood; but the modes of treatment must be very different. In the former he approved of bloodletting and depletive measures generally; in the latter he advocated the stimulating system.

Mr. Greaves was also of opinion that there were two distinct kinds of the disease, the most remarkable feature in the specific form being its feeble, almost indistinct pulse. The chief peculiarity of his treatment was the application of hot cloths to the sides, in lieu of mustard as advocated by other practitioners.

Mr. Browne recommended warm clothing and exposure to cool air in all cases of this character. Sometimes he applied mustard to the sides, though not invariably, and he thought it impossible to lay down any specific course of treatment, as we must watch the various symptoms as they presented themselves, and steer our course accordingly; but he regarded as a medicine the carbonate of ammonia almost as a "sheet anchor."

Mr. Morgan relied exclusively upon stimulants, his favourite remedy being the Sp. Eth. Nit.

Mr. Haycock made some remarks upon the physiological character of the disease. The blood, he contended, presented peculiar aspects, containing a large amount of serum, and the red corpuscles being much broken up. In some lingering cases he had found much benefit to result from brewers yeast' being given and nux vomica.

Mr. Lawson used mustard freely externally, and gave Liq. Amm. Acet. et Sp. Eth. Nit. cum Ext. Belladonna. He strongly objected to giving either aloes or calomel, however small the dose, but in some cases he had given small doses of sulphate of magnesia.

A vote of thanks to the essayist was moved by *Mr. Whittle*, seconded by *Mr. P. Taylor*, and carried.

The officers for the ensuing year were elected, and the financial

condition of the Association was found to be eminently satisfactory.

Mr. Browne gave notice of his intention to move at the next meeting that the annual subscription be reduced to ten shillings; *Mr. Greaves* of his intention to propose that a donation from the funds of the Association be made to "The Mutual Benevolent and Defence Society."

The business of the meeting then terminated.

GEO. BROWNE, *Secretary.*

Veterinary Jurisprudence.

HARLESTON COUNTY COURT.—TUESDAY, NOV. 5TH.

(*Before* J. WORLLEDGE, *Esq.*, *Judge.*)

IMPORTANT TO FLOCKMASTERS.

THE following was the only case of public interest heard to-day.—James Dawes, sheep dresser, Rose Villa, Fornham All Saints, *v.* Henry Baumbach, farmer, South Elmham Hall. Claim £14 18s. 7d., balance due for dressing 501 sheep, comprising 300 lambs, 197 ewes, and 4 rams, at 12s. 6d. per score. Defendant objected to pay, on the ground that some of the sheep died from the effects of the dressing, and others had not been cured.

Mr. Walpole for plaintiff; Mr. Kent for defendant.

The case excited considerable interest, and occupied about four hours.

Plaintiff's version of the affair was that he received a letter from Mr. Baumbach, requesting him to dress the flock for the scab, which he did, on the 23rd and 24th of April, 1866. The sheep were dipped in a wash made of ingredients he had used for twelve years. Three of the sheep died on the first day, and one on the third day, which he attributed to internal inflammation, caused by being pulled about, and from their being too full of food at the time of dressing. Mr. Grimmer, veterinary surgeon, Bungay, was sent for, who said the sheep had died from poison, because the coats of the stomachs were off. He (plaintiff) told Mr. Baumbach that he would pay for all that could be proved to have died from poison. On the 12th of May he received a letter from Mr. Baumbach, stating that some of the sheep had died from the injurious use of tobacco wash. He went to South Elmham in May and saw the sheep, which appeared to him to be all right and sound, and left a pot of ointment with the shepherd to use in case any spots appeared on the sheep, and told Mr. Baumbach that if there was anything wrong with the sheep he was to let him know, and he would go over and look at them. That was the last he had heard of the sheep. in cross-examination, plaintiff said he advertised in the newspapers, and his terms stated therein were—"No cure, no pay." The ingredients of the wash were given, after some pressing by the Judge. The tobacco wash used produced congestion of the lungs, and some

of the sheep were bled to ease the inflammation. Mr. Baumbach did not make any objections to his going on with the dressing.

Defendant stated that plaintiff told him that if he did not cure the sheep he did not expect any money. He told plaintiff he left everything to him, and that the shepherd would act under his directions. Some of the sheep were staggering about after they had been dipped, and one died about ten minutes after it was taken out of the tub. He told plaintiff he could not allow him to go on killing his sheep in that way. On the second day three sheep died, in addition to four which died on the first day. The sheep were examined several weeks after they were dipped, and a great many of them were found not cured. Plaintiff examined the sheep in May, and rubbed some ointment upon them. Some of them were bad with scab then, and got worse afterwards. He asked plaintiff if he were not going to pay him for the ewes he had killed; and plaintiff replied, "If I killed them by my dressing I will pay for them." Defendant afterwards sent for Mr. Blois, sheep dresser, of Dennington, who gave the sheep one dressing, which cured them, and none of them died. Mr. F. Freeman, of Roydon, wrote to plaintiff for defendant, stating that he should claim £22 4s. for the ewes which died.

After Mr. Blois and the shepherd had given their evidence, Mr. Kent said if there had been time after the receipt of the summons, an action would have been entered for the recovery of the value of the sheep which had died from the dressing. His client was anxious that the public should know the exact position in which he stood, and therefore did not pay anything into Court, so that the case might be heard.

His Honour remarked that there was not enough ointment left by plaintiff at the defendant's to dress the whole flock. It was no part of the contract that plaintiff should have notice to see the flock again, and he would ask—How long was a farmer to have his sheep suffering? The advertisement stated, "No cure, no pay." The fact that six of the sheep died under the treatment was not a circumstance which was likely to give a very favorable impression of the treatment. He was perfectly satisfied that plaintiff did not give notice to be sent for again; and he was also satisfied that the flock was not cured, and therefore the "No cure, no pay" applied to the case. The disease being infectious, it should have been eradicated from the flock. He would assume that the four rams were cured. The lambs were out of the question, and he should deduct £6. 3s. 1d., being the charge for dressing nine score and seventeen of the sheep, and that would reduce the amount to £8 15s. 6d., for which judgment would be entered.

Mr. Kent said he should be glad if his Honour would make the amount payable at the next Court, as he should at once enter an action for the loss of the seven sheep.

His Honour agreed to this, and suggested that a jury should be empanelled to try the case.

IMPORTANT CATTLE PLAGUE CASE.

WESTLAND *v.* GORDON.

THIS was an action at the instance of William Westland, crofter, Tullos, Nigg, against Thomas Gordon, cattle dealer, Holburn Street, Aberdeen. The summons concluded for payment of £35 sterling, being damage "sustained by the pursuer, who, on or about 10th December, 1866, purchased from the defender a black and white cow, with short horns, in consequence of said cow having been, at the time she was sold by the defender to the pursuer, afflicted with pleuro-pneumonia, or other cattle disease, as was well known to the defender, who, however, fraudulently concealed that fact from the pursuer, and in consequence of two other cows, the property of the pursuer, having, when the said black and white cow was, by the pursuer, who relied on that cow being then in good health, in doing so, placed in the same byre in his premises at Tullos aforesaid with them, caught from the said black and white cow the said disease of pleuro-pnenmonia, or other cattle disease, and died thereof."

The defender, in addition to a preliminary defence, which was repelled, denied the statements in the summons, and pled that the pursuer gave up and annulled the contract of sale between him and the defender, and returned the cow sold to him by the defender, and that, having done so, it was competent for him to sue for damages following on that contract.

Parties were sent to proof upon their averments, and evidence was led at some length, sixteen witnesses having been examined for the pursuer, and five for the defender.

Sheriff Thomson has now, after hearing parties, pronounced the following judgment:

Aberdeen, 8th November, 1867.

Having resumed consideration of this cause, finds, in point of fact, that the defender, on or about 6th November, 1866, in the byres of John Angus, Hazelhead, saw a red and white cow, which he stated to be, in his opinion, labouring under lung disease or pleuro-pneumonia: That, on the 5th December following, he was informed by the said John Angus that a calf belonging to him was ill, and that he wished to sell off his whole stock, as being infected with disease: That, on the evening of the same day, the defender went to Angus's byre, and examined his remaining stock, which consisted of the said calf and three cows: That he knew that the cow he had previously seen ill had been destroyed: That he also knew that Angus desired to sell his stock on account of disease being in the byre: That the defender offered to buy them at a price which he named, on this ground, that they must be at once killed, and that he did so on account of his said knowledge of their being in all likelihood diseased: That one of the cows so bought by him from Angus was a black and white one, with short horns, and on the eve of calving: That, the following night, the last-mentioned cow and another had sold them to him for immediate slaughter, and

because of his belief that they were diseased, and that the disease would very soon develop itself: That, on the 10th December, the defender sold the said black and white cow to the pursuer: That at the time he sold it he had every reason to know that it was affected with pleuro-pneumonia, or other infectious disease, except that the disease was not developed in the animal at the time: That the defender concealed his suspicions from the pursuer: That the pursuer was entitled to rely on the said cow being in good health: That when the cow was subsequently removed from the pursuer's by the defender, she appeared to be suffering from pleuro-pneumonia: That two of the pursuer's other cows were infected by the said black and white cow, and subsequently died of the said disease: And, in point of law, that the defender is responsible for the loss occasioned to the pursuer by the death of his said two cows: That the said loss is fairly estimated at thirty-five pounds sterling: Therefore, repels the defences, decerns against the defender for the said sum of thirty-five pounds sterling, in terms of the conclusions of the summons: Finds the pursuer entitled to expenses.

(Signed) JOHN COMRIE THOMSON.

Note.—It seems to be now settled that such damage as is here sued for is sufficiently direct to infer liability on the part of the defender, if only the pursuer shall make out that the defender knew that the animal in question was suffering from an infectious disease when he delivered her to the pursuer. See the case of Robertson Conaly, 25th Feb. 1851, 13 V. 779.

As is the case in all such actions, the *onus* thrown on the pursuer of proving "knowledge" on the part of the defender is heavy, and it is necessarily difficult to discharge. In coming to a decision in the present case, the Sheriff-Substitute had the advantage of a very elaborate and able argument from both sides of the bar. The first observation which occurs on a perusal of the evidence is that if the defender was innocent in this transaction, his own deposition unfortunately tends to produce a different impression. He is contradicted in almost every particular.

Further, his story is that the cow that he sold to the pursuer was not one of the cows he had bought from Angus. But he can't tell from whom he bought her. He says that she recovered after he took her back from the pursuer's, and that he sold her again. But he can't tell to whom he sold her, nor can his brother or any of his servants. Ignorance or forgetfulness of the latter fact is very serious for the defender's case, for he knew well by that time how important it was for him to demonstrate that the animal had not been suffering from an infectious disease, and that the illness of the pursuer's other cows might be attributed to some other cause. That he was aware of that is plain from the fact that he took the pursuer's brother into his byre, and showed him a cow which was said by him to be the animal which he had taken back from the pursuer, but which the witness, Robert Westland, deponds was another cow altogether. On the other hand, the evidence has left

no doubt on the mind of the Sheriff-Substitute that the cow sold to the pursuer was one of the cows the defender had bought from Angus. There was ample opportunity for him to have availed himself of Angus's offer to "prove the cow" when the report first reached the defender's ears.

The question remains, Did the defender know at the time he sold the cow to the pursuer that it was "afflicted with pleuro-pneumonia or other cattle disease"? The defender maintained that the proof did not establish that the animal did actually suffer from that disease at all. But the byre from which it came had just before contained a cow and a calf which were so affected, and two of the cows in the byre to which it was taken became affected with pleura, while there were no other cases of that plague in the district at the time.

Further, it is sworn to that when the cow was taken back from the pursuer's to the defender's it exhibited all the symptoms of pleura which are usually discovered during life. It was with much force argued for the defender that had he thought it diseased he would not have put it among his own stock. But (1) he got it from Angus on the 6th (Thursday), on Friday he told the pursuer he had some very nice cows, and asked him to come next day to see them, and on the Monday he sold her to the pursuer. The defender lost no time in being quit of her. And (2) the cow sold to the pursuer was in a byre *with one other cow and a stot which was itself unwell.*

It is probably true that the defender thought it *just possible* that the cow might not be infected, but his knowledge of its previous history, his having bought it *for killing* from a man who wished to clear out his stock on account of it being infected with pleuro-pneumonia, and his whole conduct in the matter, having satisfied the Sheriff-Substitute that he sold it *periculo suo*, and that he is responsible for the consequential damage which ensued to the pursuer.

The evidence led by the defender is, it is thought, of a quite unreliable sort. The servants of the defender who were examined are self-contradictory, and they are all unable, apparently, to give him a notion of the person from whom or to whom the cow which is supposed to be the *origo mali* was sold.

(Initiated) J. C. T.

HORRIBLE CRUELTY TO CATTLE.

VERY recently John Todd, farmer, Arrowthorne, appeared at Leyburn to answer a charge of ill-treating and torturing eight heifers, by cutting off their horns, on the 11th inst.

William Wake stated that on the day in question he was called upon by the defendant to assist him in fetching eighteen Irish heifers out of a field on the farm, and putting them into a fold. One of the animals was then tied firmly up by the defendant so that it could not stir about, and with an ordinary saw he cut away the horns close

by the head. Blood flowed in considerable quantity during the operation, and the animal stamped and moaned very much. After seven of the heifers had been treated thus, Wake, becoming disgusted with the work, refused to help further. Tod continued the work, however, and did not desist till fourteen were denuded of their horns.

Witnesses were called by the defendant to prove that cutting off horns in the manner he had done was not uncommon in Northumberland and the North.

The magistrates inflicted a fine of 1s. and costs in each case—in all £7 12s.—with the alternative of fifty-six days' imprisonment.

The fine was paid.

GROSS CRUELTY TO A GANDER.

William Radcliffe, a butcher, of Cowcliffe, was summoned at Huddersfield on Thursday, Nov. 28th, for torturing a gander.

It appeared that the defendant and John Simeon, farmer, Storthes, wagered a sovereign as to the weight of their respective ganders. Before the birds were weighed, Radcliffe sent for two pounds of shot, and administered it to his gander. After the wager was decided, Simeon bought Radcliffe's gander for 11s., and it was taken to his farm, where it died on the Monday night following, and when opened two pounds of small shot were found in its gizzard.

The magistrates fined the defendant 10s. and costs.

OBITUARY.

We regret to have to record the death of Mr. Roger Hampson, M.R.C.V.S., which took place on the 18th ult., at Bolton, Lancashire, in the thirty-sixth year of his age. Mr. Hampson was a member of the Royal College of Surgeons. His diploma from the Royal College of Veterinary Surgeons bears date May 17th, 1855.

We have to record the demise of Mr. Thomas Marshall, M.R.C.V.S., Glasgow, which took place, after a short illness, on the 1st of Dec. Mr. Marshall was an active and zealous member of the profession, and displayed a deep interest in all matters which were connected with its progress and welfare. He was a graduate of the Edinburgh Veterinary College, and obtained the Highland Society's certificate in 1851; but, impressed with the conviction that it were well that "we should be one body," presented himself in May last before the Scotch section of the Board of Examiners of the Royal College of Veterinary Surgeons and received the diploma of the body corporate. He had been recently elected President of the West of Scotland Veterinary Medical Association, in which the members were unanimous. To all he was kind and affectionate, and drew around him a large circle of friends, by all of whom his loss will not be more severely felt than by his professional brethren of Glasgow.

THE

VETERINARIAN.

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Communications and Cases.

TRICHINIASIS IN AN ENGLISH PIG.

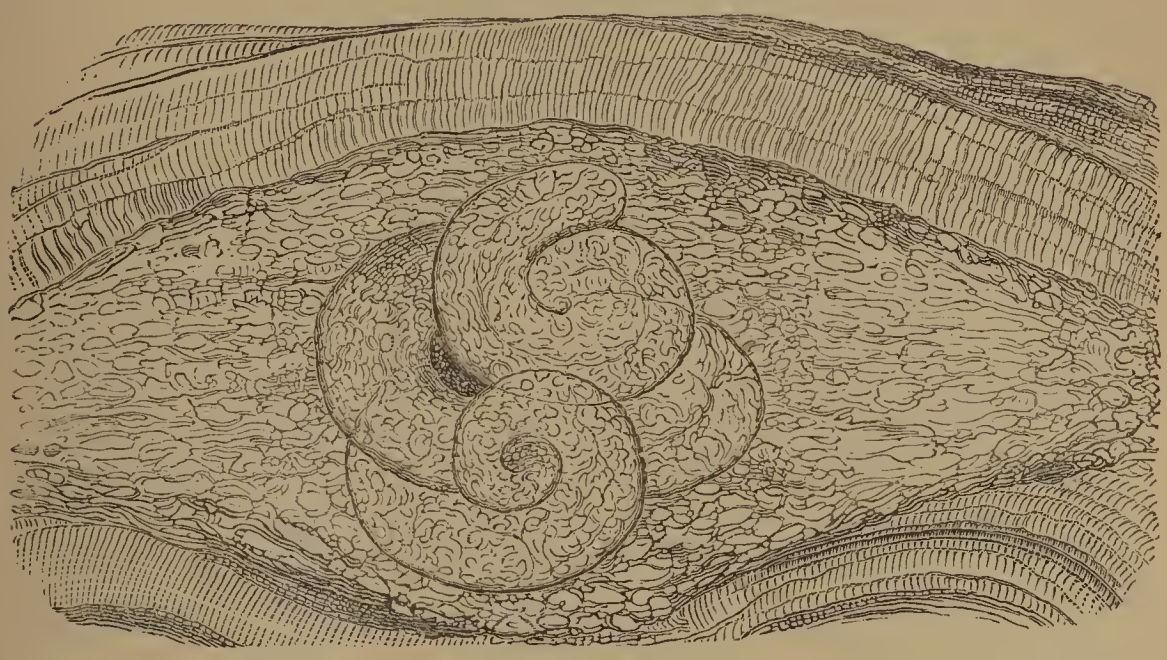
Trichina spiralis has long been known in this country as an occasional inhabitant of the muscles of the human subject, but usually to an unimportant extent, and without inducing any manifestations of disease; indeed so little effect has been produced upon the vital functions that in none of the instances in which the parasites have been detected in England has their presence been suspected during the life of the individual. In Germany, on the contrary, trichiniasis is estimated among the most serious of prevalent maladies, producing alarming symptoms, and not unfrequently causing death. In 1862 to 1864 trichinasis raged to such an extent in various parts of Germany as to have received the title of an epidemic; the deaths in some places amounted to 25 per cent., and everywhere the effects produced upon the system were extremely violent, and only ceased after considerable periods of illness, incapacitating the sufferers from active exertion for months. The signs of infection are, primarily, general sensations of illness, loss of appetite, followed by fever, with swellings of the face and in particular the eyelids, pains in the muscles, subcutaneous effusion, and frequently an obstinate diarrhœa which adds to the urgency of symptoms by inducing debility. Death occurs either from exhaustion or inflammation of the lungs, and in the event of the person being the subject of previous disease of any vital organ, it commonly arises that a violent attack of that malady is occasioned by the parasitic invasion, and a fatal result is thus prematurely determined, but even in perfectly healthy organism the consequences which acrue from the migration of the

immature brood, from the intestines to the muscular tissues, are of a character that places trichiniasis in the position of the most terrible of parasitic affections. In tracing out the origin of the disease it has generally been found that pigs are cspccially liable from their omnivorous character to become trichinised, and in nearly every instance where the disease has been detected in man it has arisen from the consumption of pork in some form, and generally eithcr raw or imperfectly cooked. Thus, minced flesh, smokcd sausage, and raw smoked ham, which are consumed in Germany, have been at various times the means of conveying the minute flesh worms into the intestines of the human being. Once in thc intestinal canal the parasites become developed, and may be seen in thirty hours after being swallowed in the form of small living worms, which very rapidly attain sexual maturity, and produce an immense numbcr of active embryos. The brood directly migrate to the muscles of all parts of the body, coil themselves up, and soon become cncysted. When the parasites exist in small numbers they appear to produce no appreciable effects upon the organism, but when they are taken in abundantly from succcssive feedings on trichinised flesh, the symptoms which have been described are induced.

Hitherto in this country we have rejoiced in a feeling of security. English swine and other animals used for food have been, so far as we were aware, exempt, save when they were made the subjects of experiment, when they, in common with the other animals experimented on, excepting birds, proved to be quite susceptible. A few months ago, however, Mr. Fedard, of Buckland, near Dover, published a statement in the local papers, to the effect that he had discovered trichinæ in the muscles of a pig which had been sent to him when quite young for examination. The circumstances are briefly these:—In July last, a pig a few weeks old, one of a litter presumed to be affected with filariæ in the bronchial tubes, and all of which subsequently died, was sent to Mr. Fedard. Instead of destroying the little animal for dissection, Mr. Fedard kept it, and under his careful tending it recovered, and grew to a sufficient size to be fit for the butcher. In October the animal was slaughtered, and before the carcase was cut up, Mr. Fedard, being desirous of preparing some specimens of the fibrillæ of muscle, placed portions of the pig's flesh under the microscope, and immediately detected trichinæ. Further observation showed that these parasites had penetrated to the whole of the muscular tissues, but

they were most abundant in the tongue, heart, and muscles of the shoulder.

Specimens of the infected flesh have been kindly placed at our disposal, and the accompanying illustration is taken from a specimen which was prepared in the manner previously recommended in the articles on the "Microscope in Veterinary Medicine."



Encysted trichina spiralis in the flesh of an English pig (magnified 300 diameters).

An examination of the figure will show that the worm is coiled upon itself in a spiral form, hence its special name, that it is enveloped in a quantity of exudation matter, the product probably of the irritation induced by its presence. Its structure is exceedingly simple, in fact it can scarcely be said to possess any special organ in its immature condition, but under a high power, $\frac{1}{25}$, certain rudimentary structures can be discerned.

Strict inquiry has been made in the endeavour to discover even a probable source of origin of the trichina in the pig sent to Mr. Fedard, but hitherto without success. Feeding experiments with portion of the trichinised flesh are being carried out for the purpose of ascertaining whether the worms retain their vitality; and if any positive results are obtained they will form the subject of comment, but it can hardly be expected that after six weeks' immersion in preservative fluids the trichinæ will still possess the power of development which characterises them in their recent state.

There is no reason to suspect that trichiniasis is extensively prevalent among English pigs, but its occurrence in one

animal in a country presumed to be free from the condition of infection is a matter of sufficient importance to call for the most complete investigation.

THE THERMOMETER IN VETERINARY MEDICINE.

By G. Fleming, Royal Engineers.

The value of the thermometer in veterinary medicine, as an aid in the diagnosis of various maladies, appears to be attracting more attention on the Continent than it has, perhaps, yet received in Britain. In a recent number of the 'Journal de Médecine Vétérinaire de Lyons,' M. Zundel, the indefatigable and distinguished veterinary surgeon, of Mulhouse, has given us a brief but interesting review of the results derived from the employment of this instrument in Germany, France, and elsewhere, which, I think, cannot fail to elicit the approval of those amongst us who are making the subject of comparative pathology their more particular study.

It will be remembered that shortly after the Cattle Plague had been introduced into Britain in 1865, Professor Gamgee discovered that the thermometer was a most valuable index of health and disease in cattle supposed to be, or which were actually contaminated, affording distinct evidence of the malady, while as yet the animals appear to be in perfect health.* Others after him had recourse to this diagnostic aid with more or less success; Dr. Sanderson, in his section of the Royal Commissioners' Report on Cattle Plague, fully attesting to its trustworthiness and value.

M. Zundel, in his review, refers to some observations made by Professor Zangzer, of Zurich, in 1865, in which, by means of the thermometer, he could easily distinguish a case of encephalitis from one of immobility; the normal temperature of the horse is 38° Centigrade. In encephalitis, after the instrument had remained in the rectum a few seconds, it rose to 40°, and even to 41°; whereas in immobility the temperature was unaltered.

* Paulet, in his history of epizootic maladies, informs us that when cattle plague was decimating the herds of France towards the middle of the last century, a veterinary pupil particularly noticed an elevation of temperature in the rectum of infected beasts before any of the usual symptoms had manifested themselves.

Since 1865, says Zundel, this means of diagnosis, which was more particularly studied by Professor Wunderlich, of Leipzig, has been tried by many German veterinary surgeons, and notably by MM. Schmelz, of Marburg; Schmid, of Hofgeismar (Hesse); and Adam, of Augsburg; especially in cases of influenza. Myself, he also adds, have employed it as well in certain cases of colic; but in the hands of Gerlach, of Hanover, Zangger, and Pflug, it has proved of great advantage in diagnosing the existence of Cattle Plague.

The mode of using the thermometer appears to be the same as in this country. The instrument is nothing different from the ordinary mercurial one, being of small size, and lodged in a glass tube about 15 centimètres* in length, which again may be carried in a wooden case for convenience. It need not be marked any higher than from 40° to 45° Centigrade, but its scale ought to be divided into tenths of degrees. This thermometer is introduced into the anus of the animal to be examined, to the depth of about a décimètre;† it should be left there for five minutes, or even less, if the external temperature is not too low, and as it is slowly withdrawn again the amount of heat it registers is noted. In the female the thermometer may be conveniently inserted in the vaginæ; but it must be borne in mind that there is always from 0·2° to 0·5° Cent. lower than in the rectum; Gerlach has even noticed a difference of a degree, so that less reliance can be placed upon these figures in comparative observations. This difference of temperature between the rectum and vagina is particularly marked in cows which have recently calved, and also in those which are in heat (Rueff).

Schmelz considers the use of the thermometer as important in guiding the judgment during the progress of a disease, and for establishing a diagnostic as auscultation and percussion; it may enlighten the practitioner when the symptoms would deceive him. The proper heat of the body is that of the blood, the physical and chemical composition of which depends on the state of the general constitution; the thermometer then affords certain indications regarding this state.

The experiments of M. Colin have demonstrated that the animal temperature is not the same in all parts of the body; but the differences are so insignificant enough as to merit no attention from the practitioner, so that we may admit, with Wunderlich and Schmelz, that the temperature of the healthy body remains the same under all circumstances; at least, the variations which may depend upon the different seasons, the

* The hundredth part of a meter.

† The décimètre is about 3½ inches.

state of plenitude of the viscera, and the *condition,* are scarcely appreciable.

There is, nevertheless, a marked difference between the temperature of the animal body in the night and morning. Gerlach and Rueff have stated that in the morning the temperature is always a little lower, and that the difference may vary from a tenth to a degree.* Rueff also admits differences depending upon the special care bestowed upon animals in the stable; labour also has an influence in this respect, particularly if it be fatiguing.

A horse perspiring after a rapid galop shows augmentation of a degree, and this exalted temperature continues until the respiration has become tranquil. These variations are, however, not of much importance, and numerous observations establish the following to be the mean temperature of the principal domestic animals:

	Centigrade.†		Centigrade.†
Bulls	38°50	Horse and Ass	38°75
Cows	39°25	Pigs	40°50
Calves	39°50	Dogs	38°50
Sheep	40°25	Cats	38·00
Ewes	40°60		

From many observations made by Schmelz, that veterinarian concludes, 1. In acute affections accompanied by fever there is a rapid augmentation of the internal temperature. 2. This augmentation ceases and becomes fixed from the period when the malady is declared and fully developed. 3. Every diminution of temperature in acute maladies is a favorable prognostic sign, even when the other symptoms do not yet denote any amelioration. 4. If the augmented and abnormal temperature persists for any length of time, it is a bad sign, even when the other symptoms indicate amendment.‡ 5. In

* Chossat had already noticed this phenomenon in 1843: he considered it as regular, and named it the diurnal oscillation of the animal temperature. —*Muller*, 'Physiology.'

† It is much to be regretted that men of science throughout the civilised world do not adopt an uniform standard of weight and measure. It would greatly aid them in their calculations, and make these more readily understood. This particularly applies to thermometry, in which we find three different scales for the registration of temperature. The French Centigrade is, perhaps, the best, and is the one referred to above. This thermometer has the zero or O at the freezing point, instead of 32°, as in Fahrenheit's thermometer, the distance between that and the boiling point of water (212° Fahr.) being divided into one hundred degrees.

‡ Liebermeister has asserted that in all infectious diseases having a markedly malignant termination (pyæmia, gangrene, &c.) there is to be found, as almost the only peculiarity, an elevation of temperature. It may and ought to be admitted that an animal cannot long withstand a temperature

nervous affections the thermometer gives very varied results. In tetanus the increase of tempcrature is greatest; with the horse it rises to 40°, and even to 42·5° Cent. The increase is less in encephalitis, and decreases as this malady diminishes in acuteness; while in immobility there is the least augmentation. 6. The degree of temperature is not always in relation with the state of the pulse or the respiration; nevertheless it has always a connection with the activity of the heart. 7. Acute pain is always accompanied by a strong increase of temperature. 8. In paralysis there is a diminution of temperature.

MM. Schmidt and Adam have employed the thermometer in influenza, and their observations show that the temperature in that disease has risen to 40°, and even to 42·5° (Adam says to 43·75°); a reduction of temperature to the extent of only one degree was a sure favorable sign, and always preceded the other indications of ameliorations. But if the temperature, at one moment descending, suddenly became elevated, it was a dangerous symptom. The absence of relation between the temperature and the state of the pulse was a grave sign; usually these cases terminated in death. A rapid augmentation of the temperature was more serious than a slow increase.

Zundel says that, relying on the indications furnished by Schmelz, and the facts presented to him by Professor Zangger, he on many occasions made advantageous use of the thermometer in cases of colic, to distinguish those of an inflammatory character, in which it was necessary to abstract blood from those due to atony of the digestive canal, where, on the contrary, such stimulants as the spirits of turpentine were required. In the inflammatory colics, which it may be said *en passant* are the most rare, there is an increase of one or two degrees: that is, the thermometer stands at 40°; while in the colics, accompanied with arrest of the peristaltic motion, the thermometer descends below the mean standard, and marks 37°, in some instances even below 36°. In the latter cases the animals are dull and so prostrated that they scarcely yield themselves to disordered movements; these are serious colics, necessitating the employment of croton oil externally. Rueff has noted an augmentation of a degree during the diarrhœa of calves, and in the aphthous fever of cattle. There is a diminution of temperature in that form of cyanosis due to empoisonment by narcotics.

above that of health, and that it kills the sick as much as the waste produced by fever. This was the idea of Galien, Sydenham, and Böerhave, and it is confirmed by the experiments of Roger, Van Baerensprung, Wunderlich, and others.

According to M. Zundel, the best application of the thermometer in veterinary medicine was that made in 1865 by Gerlach, the distinguished Director of the Hanover School, the result of whose researches has been confirmed by Rueff, Sanderson, and Pflug.* The bovine pest is accompanied by a strong augmentation of the internal temperature, which reaches to 41°, and even to 42·2°; and the severity of the disease is intimately connected with the degree of temperature. But that which is most interesting is the fact that this rise precedes the symptoms by a day or a day and a half or two days, according to Sanderson. The latter gentleman had seen an augmentation of temperature in inoculated cattle in thirty-six or forty-eight hours after the operation, although the fever, properly speaking, did not show itself until two days after. This is not a specific characteristic of the Cattle Plague, but an excellent means of recognising the malady beforehand, when we know that it prevails in a stable or in a locality; and experience has proved that, in practice, it is of the greatest utility to be thus forewarned. It results from the numerous experiments of Gerlach, and which he has related in his excellent treatise on the Cattle Plague:—1. That this augmentation of temperature is rapid until it attains its maximum, when it remains stationary for some time—two or three days at the most; then it descends, and continues only a little above the normal standard. 2. That a relapse, due, for instance, to the ingestion of aliments, is rapidly accompanied by an increase of temperature, and that often the mercury rises to the degree marked in the early period. 3. That, in order to study the disease in a thorough manner, the thermometer must be frequently consulted, particularly when it is remembered that there are regular diurnal oscillations, and consequently a necessity for comparing the observations taken at other times with those of the morning or evening; or, what is better, to follow the example of Gerlach, and form graphic tables indicating by broken lines the variations of the thermometer. 4. That a tardy augmentation from day to day is an unfavorable symptom, and that a sudden depression of temperature is a sign of approaching death. 5. That when, after a considerable elevation of temperature, there takes place a rapid fall, the mercury descending even below the normal mean, we have precursory signs

* I am not aware whether Professor Gerlach resorted to thermometry in diagnosing Cattle Plague previous to Professor Gamgee's experiments in 1865. M. Zundel does not once mention Gamgee's name, though I have always understood him to have been the first to employ the thermometer in this malady.

of a collapse, of adynamia, of great prostration of the vital forces, and death is inevitable, even when the thermometer again rises a little. 6. That if the temperature gradually descends to the medium degree, the re-establishment of health is certain, and we may rely upon this result, even when the other symptoms do not yet indicate any sensible amelioration. This augmentation of temperature in Cattle Plague, adds M. Zundel, and which precedes all other symptoms, is also accompanied by a diminution of the lacteal secretion, as has been already observed by Bruckmuller and others.*

OBSERVATIONS ON "SOUNDNESS."

By R. H. Dyer, M.R.C.V.S.

(*Continued from* p. 6.)

There are several classes of horses we are in the habit of inspecting as to soundness, viz., the thoroughbred, race-horse, the hunter, the hack, the carriage-horse, and the heavy draught-horse; this latter will include those used for slow work. Now, it will at once be manifest that the test should in almost every instance be directed to each individual case. In the first place, we should, prior to putting our animal through this test, ascertain as near as we can the condition he is in. A reply to a question put to groom or owner, besides our own observations, will enable us to form a pretty good idea of his state. Take, for example, the race-horse, which we know to be in regular work. The test for his wind may be little short of a gallop, at three-quarter speed, for a mile or two. The hunter, if brought out of a well-known stable and has been regularly hunted with hounds, may have a long gallop without danger of doing him an injury. A carriage-horse, under similar circumstances, may have a good trial gallop. This test may also be tried with the hack, but the same cannot be said of the heavy draught horses; at the

* The symptoms of this terrible malady and its general *post-mortem* characteristics appeared to have been as well known in the last century as in this. I have already shown that the increase of temperature as betrayed by exploration of the rectum was recognised to be one of the earliest signs of infection in France in 1776. Paulet, in the same chapter in which he informs us of this fact, also mentions that the decrease of the lacteal secretion was also noted as a premonitory symptom. The French, Dutch, and German observers of a century ago, have apparently, and for all practical purposes, exhausted the subject of cattle plague.

same time these animals should have their work prolonged, but the pace must be slow. Should any of them be short of work, or in the possession of those who *deal* in horses, it becomes necessary to exercise great caution in the "wind test," or much serious harm may accrue; this remark applies also to horses just in from grass.

I repeat, the principal thing to learn is the *condition* the animal is in at the time the examination takes place. I would ask what are the supposed results of these tests? Either perfect or imperfect respiration. There may be sounds emitted during severe exercise which are not likely to interfere with respiration. These we must guard ourselves against. If sounds *are* made by the horse during the trial test, what are *they like* which are said *not* to interfere with respiration? *i.e.*, permanently. There are several sounds produced, and they are referrible to causes of a dissimilar character. One sound is produced by an overloaded stomach. Some animals are incapable of performing severe exercise immediately after eating. If examined, say within an hour after a meal, they probably are roarers, hence, mistakes may occur in writing a certificate. Others will arch their necks in such a manner as to interfere with respiration, and produce whistling; there are others which make noises with the false nostrils, &c. If these several things are met with in our practice, how necessary is it that we endeavour to make ourselves acquainted with all the circumstances connected therewith. How can this be accomplished? How is it possible for the generality of practitioners to become acquainted with such matters? There are but few amongst us who are called upon to exercise our functions, in the examination of horses previous to purchase. I make this statement with a full conviction that it is substantially correct. Is it enough for a person to be *told* that such things are sometimes met with? Suppose I were to carefully describe to an ignorant man the character of the pulse, is it within the power of that man to understand the meaning of it—is it possible that in one or two lessons he will have learnt all about it? I think not. At the same time, the pupil must be told. The different characters of the pulse under different circumstances must be made known to him, as it is not likely he will make the discovery himself. Well, when he has become fully aware of all the variations in the pulse *theoretically*, he has a great deal to do before he can *satisfy himself* that he is much the wiser for it.

He must devote himself to the question with much earnestness ere he can hope to comprehend it, as a practical man is expected to do; and so it is in regard to sounds made by

horses during severe exertion. Should there be a practitioner whose pursuits have not brought him into the way of examination of horses previous to purchase, I would caution him as to his mode of proceeding should he be placed in the position many are when a dispute has arisen, and he is for the first time instructed to give an unbiassed opinion upon the case at issue. He is not only required to give his opinion upon the case as it appears at the moment, but he is expected to offer an opinion as to the state the animal was in at the time of purchase, which might have happened three or six months before. Now, when we come to look seriously into this matter, does it not strike us as being most ludicrous? We will put a few cases by way of illustration. A, sells a horse to B, for, say, £100, warranted sound. A, has of course tried the animal in the way which suits his purpose, and is satisfied. The horse is taken home, and, being a hunter, is sent to the next "meet." A's servant is interrogated by many of his master's friends as to where the new purchase was made, and so on, all of which is very natural. By and by A, presents himself, mounts his recent purchase, and is pleased to receive the congratulations of his friends upon the possession of so promising an animal. This animal, it should be known, has been purchased at the stud of a well-known master of hounds, and is known to many in the field. He has carried the master and huntsman many good runs, and was never known to be amiss. He is, however, an impetuous brute, and requires much skill and patience in riding, or he becomes a most troublesome companion, providing annoyances instead of pleasure in the hunting field. The purchaser is somewhat timid, and discovers that the horse is rather *too much for him* and regrets his bargain, besides which he has been told by several good judges that he is a "piper," or "whistler." We can well imagine all that is said against the horse, and against B, the seller. One thing, however, is perfectly clear, that the possession of a written warranty relieves A, from any uneasiness, and the animal will be at once returned, and no questions asked about it. A, writes a polite note to B, informing him that he must take the horse back, because he is unsound, he having made noises when out the day before. B, reads the note with much surprise and some indignation, in consequence of a passing remark to the effect that he put great faith in the honour of B, and did not suppose that he would have misled him into the purchase of an unsound horse. B, in his reply, is sorry the horse didn't please him, but persists that he *is* sound in every respect, and will not take him back. Now commences the *fracas*. A, sends for his vete-

rinary surgeon, a man, perhaps, of no standing, no experience as an examiner, or he may be an unqualified man; suffice it to say, he is totally unfit to grapple with such a question as this. The "vet.," feeling that he has an important task to perform, pleases himself with the notion his reputation will materially heighten in value, because there is every prospect of its being a "county court" case, and of all things in the world he should like to be witness in such a case, as it would undoubtedly advertise his name, &c., &c. The horse passes through the ordeal of the "vet.'s" examination, and is pronounced *unsound*. Copy of certificate is forwarded to B. The next day B requests A will allow *his* "vet." to examine the horse. To this A readily assents. The "vet." sent by B, pronounces the animal *sound* in every respect. This is, of course, as it should be, some people will say. It is nothing but natural that A's "vet." should write the word *un*sound for his client, and B's "vet." write *sound* for *his*. This is the place to make a remark or two upon the evidence as given in a "law court." The public generally hold that a witness employed or called by a client must so frame his answers that they *suit his case in every way*, and I am reluctant to write it, the public have sufficient grounds for such a supposition. This is too often the case. If the witnesses were to reflect for a moment what they have undertaken to do, that they are to "*tell the whole truth, and nothing but the truth,*" they would understand that they had made a most solemn promise indeed.

We have now a certificate on either side, one declares the animal unsound, the other sound. What is the next step? A sends for one, two, or more "vets.," by the advice of his solicitor, as it is now necessary to get further into trouble, so the plot thickens. The majority are in favour of the first opinion. Copies are enclosed and forwarded to B by A's legal adviser. It is now high time for B to see *his* legal functionary. The documents are taken to B's attorney, and the history of the transaction duly made known.

B's attorney is, perhaps, a man well up in these cases,—pooh pooh's the whole business. He recommends certain vet.'s names for the consideration of his client, who are summoned to attend professionally to examine a certain animal said to be unsound. These gentlemen can trace no unsoundness, and write their certificates accordingly. All these documents are submitted to A's solicitor, who reads them with comments to his client, and very sagely remarks that he had better take the *usual* course in such unpleasant cases, which is to tender the horse to the vendor, who will of course refuse

to acknowledge him. The animal is then to be taken to a livery stable and left with instructions. A's solicitor gives notice to B that the animal purchased of him, and proved unsound, is at such and such a stable, at his risk, &c., and in due course will be sold "for whom it may concern."

The sale is advertised in regular course, and the animal changes hands for less than half the original cost, say £40. A's solicitor now sues B for the balance, £60, together with costs, say five guineas more. B of course repudiates the whole thing, and the county court wheel is at once set in motion.

(*To be continued.*)

MR. GARRATT'S REJOINDER TO MR. OWLES.

If you will kindly permit me, I wish, in justice to myself, to make a few remarks in reply to a communication inserted in your last number, wherein Mr. Owles accuses me of misunderstanding his meaning, misquoting his words, and of ignorance of the physiology of the foot. These are rather grave accusations; and on reperusing the article I do not see what foundation there is for them, unless it be a sign of ignorance not to think as he does. With regard to my treatment of the horse's foot being "conservative" or not, I consider it is more conservative to remove what is superfluous and unnecessary than to allow the foot to grow out of all proportion, as I have seen in numberless instances in the army system. I am not an advocate for *undue* paring; but I approve of using the knife as a gardener does his pruning-knife—to remove what is decayed, also that which is superfluous and too exuberant; but I find that Mr. Owles denies that nature allows the *sole* to grow stronger than is required. I find in my practice many horses which cannot go with any safety or comfort without having their shoes removed and their feet moderately pared every third week. I do not consider that moderate paring is injurious to the horse's foot; on the contrary, I have seen very many feet which have become much more healthy and stronger from regular attention to paring. In my opinion the process of exfoliation is not of itself sufficient to remove all which is unnecessary when a horse has the protection of a shoe; I think that process would be assisted by the wear of the sole (quite as much as I assist it by paring) if he had not a shoe to prevent it. Mr. Owles is kind enough to enlighten me by the information that the

bars are attached to the coffin-bone. Granted; but what prevents the coffin-bone participating in the downward action, which I contend takes place every time the foot touches the ground? Is there not an interstitial substance of an elastic nature between the horny laminæ and the crust, evidently for the purpose of acting as a spring and preventing concussion? However obsolete the theory of "expansion" may be, I for one do not regard it as a "bugbear;" but I consider it a fact. Perhaps we shall next be taught to look upon "contraction" as a bugbear. Without a power of expansion in the foot itself, and assisting that power by giving more elasticity to the foot, I see not how we could counteract the many cases of contraction we meet with. In conclusion, allow me to say that my remarks are not founded upon tradition, but upon observation and practice, which, when untramelled by "routine and red tape," are worth something, although proceeding from so ignorant a person as myself; and as I am anxious to be rightly informed if I be in error, I hope some of your valuable correspondents will take up this subject.

PURPURA HÆMORRHAGICA IN THE HORSE.

By Charles Joseph Whitworth, Grantham, Lincolnshire, Graduate of the New Veterinary College, Edinburgh, and of the Imperial Veterinary College, Alfort, France, Silver Medallist.

The above is a disease arising idiopathically in plethoric animals, but it generally occurs as a sequæla of other prostrating diseases, such as "influenza," is of rare occurrence, and accompanied with extreme debility and depression of spirits, uncertain in duration, and very liable to relapse.

Some few weeks back my attention was called to a brown gelding, "the property of a Mr. Lloyd, of this town," when I observed the animal much out of condition. Symptoms:—Coat staring, very dull, appetite lost, throat sore, respiration accelerated and snuffling from effusion into nostrils, pulse feeble and quick, conjunctival mucous membranes much injected, Schneiderian mucous membranes "faint traces of petechial spots," buccal mucous membranes pallid, slight mucopurulent discharge from both nostrils, secretions scanty, urine ropy, great amount of effusion about nose and lips, as

well as painful nodules on thighs and forearms, legs much tumefied, &c. &c.

I had him removed into a well-ventilated "loose box," stimulated his throat, gave a stimulant and enema, ordered his legs to be well hand-rubbed and bandaged (as well as friction applied to all other parts that were tumefied), rugged, and made comfortable. In course of twenty-four hours the symptoms were more fully defined, nodules became confluent, increased rapidly, together with a painful tumefaction of the abdomen; the Schneiderian mucous membrane was more studded with petechial spots, and every other symptom was aggravated. In addition there was a distressing cough, arising undoubtedly from the effusion into the parenchyma of the lungs. The horse was now excessively weak, the body was bedewed with cold sweat, and the animal showed a great disinclination to move (persistently stood), which I attributed to extravasation beneath the fascia, as well as evinced pain on slightest pressure. I therefore thought energetic treatment a *sine qua non* consequently I proceeded with stimulating diuretic and tonic treatment, using Ol. Tereb. for the former purposes, and Ferri. Sulph. for the latter. Owing to the effects of Ol. Tereb. being transient, I repeated four times per diem yet did not produce undue irritation of the urinary organs, nor arrest their secretion, which was satisfactory. I ordered cold water affusions to tumefied parts, then friction to be applied until absorption was completed, which was repeated as often as medicine. His cough as yet distressed him, and on auscultating I found both lungs much implicated, consequently stimulated both sides of thorax, which gave him relief his appetite was now somewhat improved, therefore I allowed him liberal diet, and from the commencement allowed him infusum lini to drink instead of water. The symptoms gradually abated up to the seventh day, when he had a relapse, and the case now assumed a worse form. The external nares were almost impeded with tumefaction, and there was a sero-sanguineous effusion from the mucous surface (as well as a large abscess) in region of parotid gland, which fixed his head like that of a tetanic horse. The abscess was fomented, afterwards stimulated, when it discharged its contents. I had recourse to the same treatment as before, when my patient was gradually restored to health, as was, on former occasion, a mare suffering from the same disease, and which I treated in the same manner when in Northumberland five years ago. The mare was the property of James Storey, Esq., of Delaval. During the treatment she had two relapses, the intervals between them being the same as in the former case, viz., seven days.

RETENTION OF A FŒTUS.

By W. Wilson, V.S., Broughton, near Preston.

One of those extremely singular cases of retention of the fœtus has just occurred to me, some of the particulars of which I beg to lay before you.

In July last, E. Wilson, Esq., of Broughton House, brought some Irish cattle to graze. Shortly after the purchase, one of them, a polled six-year-old cow, was noticed generally keeping slightly apart from the rest, but as she grazed as well as the others, she did not attract extra attention for some time. At length it became too patent that she lost flesh as well as spirit, and that the matter was serious. I was requested to see her on the 3rd ult., when my diagnosis of the case was that the beast was carrying a dead calf, that she was some weeks, or even months, over the period of gestation, and that a dropsy—hydrops uteri, or ascites saccatus—existed. I need not here enter into the treatment I adopted—for in spite of a most unfavorable prognosis I did treat—but come at once to the point, when, seeing no probability of the animal recovering, I advised that she be destroyed. Accordingly, on November 25th she was killed, and I made a very careful examination of the body, the leading details of which I give. On laying open the abdomen, by removing the flank and some of the ribs of the right side, I was struck with the vast quantity of abnormally formed placenta-like membrane which was presented, all the viscera of the pelvis and posterior part of the abdomen being actually surrounded, enclosed, and bound up *en masse*, by fold upon fold of loose tissue, more or less thin and transparent. Cautiously clearing away the superficial portion, I was enabled gradually to get at the different viscera, and was shortly surprised to find within a double of the colon the left tibia, fibula, and patella of a calf. The bones were fully formed, but black, and matted with short hair. The intestine of the cow presented no morbid appearances, but the contents were liquid at that place only. I should here tell you that three days previous the cow had been attacked with a diarrhœa, but which attack lasted only a few hours. Passing on to the womb, I found its body and inferior portion of the fundus affected with anasarca. Within the viscus was another lot of bones, perhaps the whole set of a calf less the few found in the intestine. These, too, were blackened, massed ball-

like together with hair, and emitted a most offensive odour. I have seen the remains of a human body exhumed after having been buried in wet clay ground sixteen years, and I could compare those fœtal remains, colour and smell, to nothing more like. All animal matter but that mentioned had passed, by absorption or otherwise, from the matrix. The cotyledons were entirely absorbed, and that peculiar spongy character of the walls of the uterus had completely changed, and had become more like a bag of basil leather than anything else. The strangest part of the affair, however, was the formation of *three* distinct tubular passages between the womb—at its fundus—and the colon. The largest of these ducts was not less than three inches in diameter, and through which the bones in the intestine must have passed. Other passages there were from one part of the matrix through its walls and back again to another. I could not recognise the Fallopian tubes, and suppose they had gone to form two of the ducts mentioned. But whence the third? A little matter had made its way from the bowel to the womb. The cervix uteri was cartilaginous, and not a trace of its opening could be distinguished. The viscera of the thorax and anterior half of the abdomen were perfectly sound.

REJOINDER FROM "M.R.C.V.S.," TO WILLIAM ROBERTSON, M.R.C.V.S., Member of the Scottish Section of the Court of Examiners of the Royal College of Veterinary Surgeons.

Gentlemen,—In my communication relative to the proposed Scotch Charter, which you did me the honour to insert in the December number of the *Veterinarian*, I ventured opinions which were dictated by pure facts, and had as remote an idea of being "gratuitously calumnious," or making assertions "unwarrantable and uncharitable," as I have at this moment of being made Prime Minister of Great Britain, which is very, very remote indeed.

With the general tenour of those remarks as to the nature and probable accomplishments of the proposed charter, Mr. Robertson finds nothing to question, but takes me to task upon a point in which *he* thinks an insult is offered to the section of veterinary surgeons, of which he is a unit. Is Mr. Robertson able to answer for all his brethren? If I mistake

not, his position is exceptional, and one of the best of which Scotland boasts. In that he has practised since he obtained his diploma in 1852; and however far his "opportunities of acquaintanceship—opportunities both ample and special—with veterinary surgeons in Scotland as well as in England" may extend, they amount to nothing as compared with those to be acquired by *residence and practice in both*.

These have been *my* opportunities. I am well acquainted with the usages to which veterinary surgeons are submitted in each, and, in affording a direct and ready answer to Mr. Robertson's respectful and firm request, have to state that I derive authority and data for the remarks to which he takes exception *from actual experience*.

Let him step across the border, and settle among the warm hearts in the south of sunny England, and, with his acknowledged education, he will be able to bear me out in what I have asserted.

Lastly, my remarks were not intended for individuals, nor can I view them as offensive to veterinary surgeons. I speak of the public generally of Scotland, and again repeat, my experience has been that "they look upon the members of the veterinary profession as dissolute, and unworthy of notice."

I should be extremely sorry to occupy your pages with what looks like a useless controversy of "Calumny or no calumny" looming in futurity. They are worthy of a better use; the profession stands in need of all the good we can glean from them. I therefore curtail my reply. In conclusion, "facts are chiels that winna ding," and these only have I to offer against the laudably patriotic stand which our professional brother has taken for "his ain countrie," and which, I am happy to learn, has not yet deserved his censure.

I remain, Gentlemen,

Yours truly,

To the Editors of the 'Veterinarian.'

REMARKS ON THE PROPOSED SCOTCH CHARTER.

By W. Little, M.R.C.V.S., Wainfleet.

Having read in the *Veterinarian* for last month a report from Mr. G. Fleming, respecting the Veterinary Charter for Scotland, in which he expresses a wish to learn the views

of others on this question, I am induced to send you, as a graduate of the Edinburgh Veterinary College, my opinion of the matter.

The granting of a separate charter for Scotland would be, I have no hesitation in saying, a great injury to the profession at large; I am quite sure that those who hold the Scotch diploma only, would still not be thought equal to those holding the diploma of the Royal College of Veterinary Surgeons in scarcely any part of the county, and most certainly not in that in which I am practising.

If there were one body corporate, and no division among us on political grounds, we should have better men in the profession, and likewise be more agreeable with each other. Things would soon be altered, and we should have unity, in place of, as at present, one man who holds the Highland Society's Certificate, pulling another man to pieces who holds the diploma of the Royal College of Veterinary Surgeons, or *vice versâ*. By conduct like this we are doing our best to lower ourselves in the estimation of the public, and to assist the farmers in maintaining their hold. I do hope that our professional brethren of the north will see the folly of keeping up such a ruinous system, and that they will become favourable to real union being effected in our body corporate and politic. Much more could be said on this subject, but at present I content myself by merely recording my opinion, which I trust you will give a place to in your next issue.

PROFESSIONAL PUFFING.

By "An Observer."

In these days of modern refinement and general improvement, and when one would be led to believe that the veterinary profession must inevitably catch the infection, it is found that there are holes and corners in which the diffusibility of that salutary current has not yet reached. Here the harsh sounds of a useless and vulgar jargon exist in all their pristine characters, and literary compositions are framed under the erroneous idea that the public must be duped in order to obtain employment from them.

The sooner we have a preliminary examination the better, in order, if possible, to instil into our rising generation that the practice of our profession is not maintained by a flourish

of trumpets, nor is the public induced to send for a practitioner any earlier on account of his full diapason being composed of what he may consider atttractive "qualifications" and "special features in practice."

I cut from a local paper the following advertisements, which illustrate the species of quackery and professional puffing regarded by some people as legitimate and admissible. If it is, our profession is a delusion; but I have sufficient faith to believe otherwise.

"VETERINARY INSTITUTION.

MR. ——, V.S.,

Late Army Veterinary Surgeon at the Crimea, and late Government Cattle Plague Investigator for ——,

BEGS leave to announce to the Nobility, Clergy, Gentry, and the Public generally of —— and surrounding Counties, that he has commenced Practice in

—— STREET,

Next door to Mr. ——,

And respectfully solicits their patronage and support.

Mr. ——'s Qualifications are to the following effect:

Three Edinburgh Veterinary Diplomas, with Certificates of good Studentship.

Two Certificates from King's College, Aberdeen, for having studied those branches of human medicine which have an important bearing on Veterinary Science.

Veterinary Army Commission, with a recommendation of Professional and Literary Qualifications from the Principal Veterinary Surgeon to the Crimean Forces.

An Examiner of Veterinary Students.

Numerous Credentials from gentlemen in —— as to moral and high Professional standing; also as to invaluable corrective opinions given on *Variola Ovinia*.

His being called by the Government to act as Cattle Plague Investigator for ——.

Testimonials from the Proprietors of the —— *Gazette* for practical and valuable Veterinary contributions, and also from gentlemen who have read his letters in '*The Field*.'

Testimonial from Professor —— as to his being selected to fill a Veterinary Chair, &c. &c.

Mr. —— begs respectfully to inform the Public that, in addition to the ordinary Horse and Dog Practice, he will also devote special attention to the Diseases of Cattle, Sheep, and Pigs; and that he intends instituting a College, and

delivering a regular course of lectures, with practical instructions on the nature of the disease incident to the latter classes of animals.

—— Street, ——, Oct. 22, 1867."

The following is equally as novel:

"VETERINARY.

Professor ——, M.R.C.V.S., Lond. and Edin.; Student of the Impl. Vet. Col., Alfort, Paris, and Lyons; late Professor ——, begs to acquaint the Nobility, Gentry, and Stockowners of ——, that he has commenced practising in ——. Office: —— Street. Moderate charges, and arrangements made for attendance by the year.

Special features in Professor ——'s practice are—Operation for Spavin, avoiding blemish, and superseding blistering and firing. Operations for Cure of Roaring. Preventive Treatment for Pleuro-pneumonia in Cattle, by which valuable Cattle may be saved when attacked.

—— Street, ——."

After carefully reading these effusions, I can come but to one conclusion, the inevitable conclusion, which is,—When "examinators" and professors resort to a puffing kind of quackery, we must not feel surprised when those who have passed through the ordeal of their training and testing launch upon the same delusive sea of speculation.

How much different and how worthy of adoption is the following, similar to one in all respects lately issued by a friend on commencing practice:—

"Mr. John ——, M.R.C.V.S.,
Veterinary Surgeon,
Birmingham,
29, —— Street."

Surely we are constrained to ask, Can our profession be an elevated calling, that men use the "puff direct" in order to acquire notoriety? I am doubtful of the kind of estimate such make of its nature and resources, and feel convinced of the tendency which results, and mars our progress as a body.

Facts and Observations.

The Poison of the Cobra.—Our readers will recollect that some interesting experiments have lately been made in India relative to the action of the poison of the cobra, by Dr. Shortt. This gentleman, having regard to the numerous lives that were lost annually in India from the bite of this snake, was mainly anxious to discover some antidote for its poison, and set about testing the various remedies *in repute* for that object. After much expense, and no little risk to himself, he has found that all are valueless. Still thinking that some effective agent might be known to the natives, he offered a reward of 500 rupees for its production, stipulating that he (Dr. Shortt) should find the cobras and conduct the experiments, which were to be three in number. The prize still remains unawarded. Recently Dr. Shortt has received a communication from Sir T. Madava Row, the Dewan of Travancore, intimating that his Serene Highness the Maharajah has taken much interest in the question, and begs to offer a reward of 1000 rupees, under such conditions as Dr. Shortt may think desirable, to the person who can produce a remedy, and satisfy him that it is effectual against snake-bite. The prize therefore now amounts to £150. The discoverer, whoever he may be, will serve the cause of humanity greatly; and this announcement, we hope, will awaken an interest in the question that may lead to some satisfactory result. Dr. Shortt has been good enough to say that he will be glad to facilitate the conduction of experiments (or to receive any suggestions thereon), and that he will consign to us, for the use of any gentleman disposed to investigate the question, heads of cobras, uninjured, preserved in spirits or simply dried, or in any other way that may be desirable; and, should we advise it—the idea is exceedingly unpleasant, but if science demand we must obey, —he will send one or more cobras themselves for experiment, on our being satisfied that every precaution will be taken to prevent the likelihood of any accident occurring. Certainly never were conditions more favorable for experiment, ugly though it may be. We therefore hope the result will be the discovery of an antidote to a poison which kills so many human beings every year.—*The Lancet*, Jan. 11th, 1868.

Discovery of Rock Salt near Berlin.—A few weeks ago, as the workmen were boring for an artesian well

at a place called Sperenberg, near the Berlin and Gorlitz Railway, in Prussia, they unexpectedly struck a bed of rock salt at rather more than 300 feet below the surface. The samples brought up are quite white and clean, and a chemical analysis has demonstrated their great purity, being perfectly free from any admixture of natron, kala, or magnesia. At Stassfort, another place in Prussia where rock salt was discovered last year, a stratum of kali-soda overlies the bed of salt, whilst at Schonebeck, also in Prussia, it lies under the salt. It is, therefore, considered by no means improbable that these mineral salts, which are now so much used in agriculture and various industrial manufactures, may still be found at Sperenberg at a greater depth than has been hitherto reached; this will soon be decided, as the boring operations are being carried on with spirit and energy. Down to last week the workmen had penetrated the bed of rock salt to the depth of eighty-five feet without any indications of arriving at its lowest stratum. Under all circumstances, the owner of the ground may be thankful for his fortunate discovery; for, being situate close to a railway, he can supply the inhabitants of Berlin with salt at a very cheap rate.

Gathering of Shepherds and the Lost Sheep.—The half-yearly gathering of the shepherds whose flocks browse on the extensive range of hills going through Derbyshire, Yorkshire, and Cheshire, was recently held. The place of meeting was at the house of Mr. Taylor, on the Scatterbrook Road. The shepherds brought with them nearly one hundred sheep, which during the past six months had ranged from one flock to another, and which were identified by those present. After a substantial dinner had been partaken of, the interesting custom of singling out the truants began. Some eighty or ninety dogs were also in attendance, and as the sheep were let out a curious scene presented itself to the visitor. The dogs jumped among the sheep, barking at them, and every now and then singling out their old acquaintance with remarkable sagacity. The shepherd, thus aided by his dog, managed to identify his own, and in the course of an hour the whole had been restored. The dogs then took charge of the truants, and, in advance of their masters, drove them towards their respective stations, in some instances a distance of twenty miles. It is said that these gatherings have existed for more than 100 years, and that very few sheep are by this method not restored to their owners.—*Scotsman*.

Destruction of Horses in the Island of Marajo.—In a communication to the Zoological Society of Paris, M. Baraquin relates the following circumstance:—In 1830 there was such an abundance of horses in the island of Marajo, belonging to the delta of the River Amazon, that a president of the province of Para made an agreement with a company to allow them to kill as many of these animals as they chose, for the sake of the skins, which fetched 15fr. each, while the live horse did not cost more than 6fr. The horses were slaughtered with such carelessness that the carcasses, left unburied, caused dangerous infection, which could only be got rid of by setting fire to the whole island, which was thickly wooded. This measure caused the death of all the horses that had still survived, and since that time it has been impossible to reintroduce the breed on the island, all the horses brought thither soon falling victims to a paralysis of the hind legs.

Price of Horse Flesh.—The *Salut Public*, of Lyons, tells us that "a shop for the sale of horse meat has just been opened in that city, in the Rue Montesquieu. The meat was sold at very moderate prices, 25 centimes (2½d.) the pound for ordinary pieces, and one franc the kilog. for the *filet* and choice cuts. The display looked well, and was very fat, much to the astonishment of the public, who seem to have entertained the idea that all the poor hacks they see unfit for work would be offered for food."

Gradations in Organization.—It is the peculiar function, says a writer in *The Intellectual Observer*, of organic nature to exhibit a higher kind of identity amid change, and the quantity of regulated and co-ordinated motion that takes place in an organism is the measure of its perfection and importance. The animal stands higher than the tree, and its various processes of growth and action are dependent upon or associated with the putting together and the taking to pieces of more complicated substances than those which constitute the great bulk of the plant. The muscular system of animals exhibits a complexity of chemical formation corresponding with its elaborate arrangement of parts. The nervous system of animals is remarkable for its chemical complexity, and no thought, feeling, or volition, occurs in a living body without a multitude of atoms undergoing oscillation and change of place.

THE VETERINARIAN, FEBRUARY 1, 1868.

[Ne quid falsi dicere audeat, ne quid veri non audeat.—CICERO.

EXAMINATION FOR THE VETERINARY DIPLOMA AS A MEANS OF IMPROVING THE SYSTEM OF VETERINARY EDUCATION.

EXAMINATIONS are in every department of art and science, the ultimate test of the success of an educational system. Methods of instruction may vary, and teachers may advocate their particular plan of conveying the rudiments of knowledge into the impressible mind of the pupil; no objection can exist to a fair amount of freedom being allowed in this respect, but the best method of instruction runs the risk of degenerating into a system of lifeless routine, unless it is associated with something in the future which shall in the mere apprehension of its existence stimulate dormant capabilities, and prevent the stagnation which a belief in infallibility is certain to develope. Enough has been said here and abroad upon the subject of veterinary education; its deficiences have been insisted upon and its necessities have been urged again and again, without palpable result, but at length the attention which has been so often aroused seems to be really awake, and there is a prospect of action. Upon the council of the Royal College of Veterinary Surgeons is imposed the duty of "regulating the nature and extent of the examinations," and, therefore, in effect the education of the veterinary student. That this power has not been unduly exercised all must admit; that it might with advantage have been earlier brought to bear upon the subject may without offence be suggested; at any rate, that it is now in the act of being exercised is satisfactory. At the last meeting of council Professor Gamgee, in pursuance of an intention which he had previously announced, proposed certain alterations and amendments in the existing bye laws, relating to the regulations for the examination for the diploma. The laws as they now stand are scarcely

framed in terms suited to the position which veterinary science occupies, and on this ground alone a revision would be called for; but for more important reasons it is to be desired that Professor Gamgee's suggestion of a single comprehensive bye-law giving power to the council to make regulations respecting the examination should be substituted for the present imperfectly constructed laws which, however defective, cannot be altered without considerable difficulty and much delay. By the establishment of a single bye-law the council will acquire the power to frame rules for the conduct of the examination, and to amend them as circumstances may render necessary, and starting from this point it is proposed to admit to the teaching colleges all candidates for admission who may present themselves without demanding that they shall pass a preliminary examination, for which Professor Gamgee considers they are from their previous habits of life unprepared. After a certain period of study it is proposed to institute a *preliminary* examination in general subjects, including geography, mathematics, classics or modern languages. Such examination to take place at the end of the summer session, and to be submitted to by all candidates who do not possess a certificate of having passed a middle-class examination, or who do not hold any recognized degree. The first *professional* examination is to be holden at the termination of the second summer session, and to comprise the subjects of anatomy, physiology, chemistry, and botany. The *final* examination in pathology and veterinary practice will be reserved for the completion of the curriculum at the end of the following session.

In outline such is the scheme proposed, and it has the merit of being sufficiently comprehensive; that it will be adopted in its entirety by the council is not probable. Indeed there are strong reasons why it should not be unconditionally accepted. In the first place we believe it would not be favourably received by the schools, and any scheme which is not generally acceptable to the teaching colleges would, if attempted to be carried into effect, revive dissensions which have long been buried. We have a sufficiently

keen recollection of the derangement which was originated by the passing of the apprenticeship clause, not to deprecate any measure which might by the remotest possibility lead to a similar condition of things.

Again, the institution of a preliminary examination after a student has attended a course of lectures at a veterinary college, is fraught with the very danger it seeks to avoid. If we were in the position occupied by the medical profession, and could say, with full power to carry out our determination, that no one should be allowed to practice until he had conformed to the recognised system of tuition, and obtained the sanction of a diploma, one objection would be removed, but in our present position we cannot fail to perceive the impropriety, not to say injustice, of calling upon a pupil to submit to an examination after a period of study, say of a year's duration, and then making the discovery that he is unfit to be a student at all. Nor in the event of his passing the so-called preliminary examination is the difficulty removed. There is at least a probability that a certain percentage of students will be content with the certificate of having passed an examination at a veterinary college, and no power is vested in the corporate body to prevent the assumption of the name and title of veterinary surgeon. The whole question will be discussed, and there can be no doubt that a modification of Professor Gamgee's scheme will be carried. Of the general scope and intention of his proposal we cordially approve, and if the subject is approached in good faith, as there is reason to believe it will be, no great difficulty will be felt in arranging a plan that will be generally acceptable and at the same time in all respects effective for the object in view, the improvement of veterinary education.

REAPPEARANCE OF PLEURO-PNEUMONIA AND MOUTH AND FOOT DISEASE.

More than once or twice we have assumed the unthankful office of the prophet of ill, and now, face to face with our predictions fulfilled, we are little inclined to congratulate

ourselves upon the attainment of a success in the occult art of soothsaying; in truth, there was no mystery to be unravelled. We, in common with all the members of the veterinary profession who were practically acquainted with the system of cattle traffic, entertained the conviction that so long as the restriction upon the movement of cattle along public roads, to fairs and markets, or even by railway, were in force, pleuro-pneumonia and other infectious diseases would be held in check. There were difficulties in the way of getting rid of cattle, which were either themselves the subject of a contagious malady, or had been in contact with animals so affected. In fact, before stock could be moved at all, it was necessary that some evidence of their healthy condition should be advanced openly and in such a manner that the perpetrator of a fraud rendered himself liable to detection and punishment. Doubtless frauds were committed, and escaped discovery, but in the main the system was eminently protective in its influence; and not only was cattle plague eradicated, but other more familiar affections also rapidly subsided. Trade interests, however, were unfortunately opposed to the continuance of a restrictive system, so far at least as affected the traffic in home-bred animals; and accordingly at the earliest possible moment after the cattle plague ceased, and even before its complete disappearance, the prohibitions which had embarrassed the stock-breeder and the trader for two years were removed, and almost immediately pleuro-pneumonia and mouth and foot disease recommenced their ravages in the country. And as London is supplied with dairy-stock from the country, the same maladies very quickly resumed their vacated places in various cow-sheds in the metropolis, and committed the usual havoc.

It is worthy of remark that pleuro-pneumonia especially is prevailing extensively, and that it has assumed a very virulent form, running its course with unusual rapidity, and quickly extending among the animals which are subjected to its influence. Most of the cases which have come under our notice have been associated with more than the ordinary indication of febrile disturbance; the internal temperature

frequently rises, even in the early stage of the disease, to 106° or 107°, and after death the morbid appearances in the abomasum, and also in the small intestines, are remarkably allied to those which used to be deemed specially significant of rinderpest.

Frequently we have been able to trace the outbreak to the introduction of newly-purchased stock. Irish cattle, both in London and the country, have often obtained the credit of bringing the disease into a herd or shed. A recent order of the Irish Privy Council will probably to some extent lessen this acknowledged evil by preventing the exposure of cattle affected with pleuro-pneumonia in fairs and markets in Ireland, and even their movement along the highway; but as many cattle are collected by dealers from various parts of the country for the purpose of exportation to England, it is likely enough that animals from an infected herd will be smuggled away, and therefore we cannot hope that the introduction of the disease through importation of Irish cattle will be altogether prevented; and even if it were, we have sufficient active contagion in our own country to perpetuate such diseases as scab, mouth and foot disease and pleuro-pneumonia, if no measures are taken to prevent their extension among our herds and flocks. All advice upon sanitary matters is thrown away; legislation alone can deal with the subject effectively: and by legislation we mean not merely making laws, but also making provision for their being rigorously enforced.

Extracts from British and Foreign Journals.

MODERN CHEMISTRY.

The rapid strides which chemistry has made of late, especially in its synthetical and higher branches, are among the striking phenomena of an age whose salient feature is pre-eminently the advancement of the physical sciences. Chemistry, which can scarcely be said to have had its birth till towards the close of the last century, having during the first

half of this attained a vigorous childhood, is now passing through a stage of awkward adolescence towards, we believe, a healthy maturity. But it is precisely this crudeness that renders the current literature of the science unintelligible to the medical man of some twenty or thirty years' standing. In the days of his youth all was order, and the slight differences which existed in the symbolism of chemistry were regarded as trivial and unimportant. The doctrines taught were sufficiently consistent; and though some ugly facts militated against received theories, yet these latter were generally supposed to be thoroughly in accordance with experiment. The brilliant generalisations of Liebig served also to divert the minds of chemists from the fundamental notions which underlay notation and nomenclature. Laurent and Gerhardt stirred these deceitful depths, showing the untenableness, both on experimental and logical grounds, of the received theories; and since their day a host of followers has striven to evolve order once more from the muddy pool which those *savans* left behind them. Even now chemistry can scarcely be said to have entirely emerged from the chaos in which it has for some years been involved. That it is rapidly emerging, however, will be made evident to any one who will peruse any of the more systematic modern works on the science, such as Naquet's 'Principes,' an English translation of which has just appeared.

Advanced chemists of the present day are accused by their more conservative brethren of being theoretical; by which we suppose it is intended to stigmatise them as unpractical. But there was never perhaps a time when those ruthless innovators pursued the path of experiment with greater zeal. As for theory, probably there are more assumptions in most pages of such a work as Brande and Taylor's manual than in a corresponding page of M. Naquet's treatise. Many medical men who studied chemistry by the light of the older views are deterred from attempting to master modern chemical memoirs by the mistaken notion that the whole science is chaotic, and unfathomable by any but experts. The recent attempt of Sir B. C. Brodie to found chemistry upon a purely experimental basis, discarding the time-honoured atomic theory, and the opposition which this attempt has met with at the hands of our leading chemists, have fostered this idea. Nothing could, however, be more erroneous. Should any one have the energy to "rub up" his knowledge of chemistry by the aid of some good book, such as that we have just indicated, he will find but little difficulty in doing so. He will also be disabused of the notion that formulæ

written in the new notation are such abstruse and barbarous things as the Pharmacopœial Committee seemed to have wished them to be considered. If there is one direction more than another towards which this science is now tending, it is that of order and system. The history of some of the better known series of organic compounds is as fascinating as a novel; and this method of studying bodies in series is incomparably superior to the old method of classification according to qualitative composition.

Let us endeavour briefly to convey to the minds of our readers, whom, for the nonce, we will assume to have just that amount of knowledge which an ordinary medical man may be presumed to possess, who obtained his diplomas some twenty years ago, what are the chief alterations they may expect to meet with on taking up a modern work on chemistry. We cannot do more than this, for to review the whole history of chemistry during that period, or even to attempt a simple enumeration of the brilliant and useful discoveries which have been made, would occupy more space than we can afford.

In the first place, then, they will find that the greater number of the elements have their atomic weights doubled, or, in other words, where we formerly wrote HO we now write $H_2\bar{O}$; $\bar{C}_2H_6\bar{O}$ instead of $C_4H_6O_2$, &c.; the atomic weights of O and C being doubled, as is indicated by the barred symbols, though the bars are most frequently omitted. The question is often put to us, "What elements have their atomic weights doubled?" A short statement, exact enough for the purpose of the medical practitioner, may be given. Those of all the metals in the 'Pharmacopœia,' except the alkali metals, and silver, gold, arsenic, bismuth, and antimony, are doubled, whilst of the non-metals, oxygen, sulphur, carbon, and silicon have their atomic weights doubled. Another alteration is that by which formulæ are written in what are styled *types;* the molecules of all compounds being supposed to have a certain structure, any piece of which may be removed and replaced by a similar piece of another molecule without destroying the symmetry of either. All bodies are thus referred to four types—

$$\text{Hydrochloric acid } HCl, \quad \text{Water } \left.\begin{matrix} H \\ H \end{matrix}\right\} O,$$

$$\text{Ammonia } \left.\begin{matrix} H \\ H \\ H \end{matrix}\right\} N, \text{ and Marsh gas } \left.\begin{matrix} H \\ H \\ H \\ H \end{matrix}\right\} C;$$

but all compounds may be referred to the last, and are so referred by many chemists, though the exclusive use of this type has its disadvantages. The doctrines of quantivalence, or value in exchange, and of atomicity, that underlie the theory of types, and which cause the terms "equivalent," "atom," and "molecule," to have precise and quite distinct meanings, have been well laid down by Hofman, Odling, Naquet, and others. The marvellous beauty and order with which compounds that were formerly bugbears to the student, range themselves in series and under types, will astonish any one who has been accustomed to follow the old notation alone, and will carry their own commendation to those who wish to familiarise themselves with recent extensions in chemical science.

The doctrine of residues, resting on a purely experimental basis, and being merely a modification of the theory of types, has been forced upon us by the advances of synthetical and analytical discovery. It has served to unravel many a tangled web in organic chemistry. Dr. Odling, in his little work on organic chemistry, has illustrated its application in a striking manner. It teaches us that the most complex molecules of animal and vegetable organisms are made up of the *residues* of such simple materials as water, carbonic acid, ammonia, &c. Thus, hippuric acid has a highly complicated molecule formed out of the residues of the simpler bodies, acetic acid, ammonia, and benzoic acid; the last being again composed of carbonic acid and Faraday's bicarburet of hydrogen.

Not long ago the dogma was pretty generally held that no organic compound could be formed except from pre-existent organic bodies, but this is no longer tenable. The synthesis, or building-up, of urea, alcohol, and a host of complex substances is now an everyday occurrence, and the vastness of the field thus opened up to future research is almost inconceivable. During the past year, again, Mr. Chapman has given us a new engine of research, which he terms "limited oxidation," by which we are enabled not only to build up organic molecules, but also to break them up into their proximate constituents. By such means we may reasonably hope that our knowledge of the chemical transformations going on in the animal body will undergo a great extension.—*Med. Times and Gaz.*, Jan. 11th, 1868.

EXTRACTING TALLOW FROM CARCASES.

The Melbourne *Economist* states:—"We learn that Mr. John Van Hemert has protected his system of extracting tallow from carcases by a 'patent.' The plan adopted is so simple, as well as effectual, that nothing but a patent could protect him. As the system of boiling down our surplus stock must assuredly be introduced into almost every district in the colony, in such an extraordinary grass-producing season as this, it will be the object of the squatter to obtain the most simple and cheapest apparatus for the purpose. From what we learn of this new plan, there is no expensive boiler for the purpose of producing steam, independent of the 'steam boiler,' which is boiler and vat as well; only a small quantity of water is used, and by an arrangement with a false bottom it is found impossible to burn the tallow. Clarification by a very simple process is effected, before the tallow is poured into casks, into which it is said to flow as white as paper. As these new boilers are made small enough for fifty sheep, and large enough for 400, every sheep-owner will be able to establish a boiling-down plant to suit. There is a strong objection, in more senses than one, against boiling down on private establishments, and that is the abominable stench which has always followed the slaughtering; but the plan now adopted and recommended is to choose a spot of ground workable with a spade. Dig a trench, say, four feet wide and two deep, throw in the offal from both the slaughtering yard and vat; cover up by digging a second trench alongside the first one, leaving a six-inch wall of earth between. This mode completely deodorises the offensive animal matter; and the whole being turned over in a few months and well mixed, will form a valuable mass of manure, perfectly free from taint, but very effective for either grain, roots, or grass. The Brisbane people are not satisfied with tallow alone from their animals, for a Dr. Bancroft is now engaged, and has been for several months, in experimenting with the meat, and preparing it by a process of his own, for domestic purposes; he professes to retain all its original valuable and nutritious properties. The doctor claims for his system the special advantage of preserving more of the good qualities of the meat and fat than can be secured by any other mode of drying. The cost is very trifling, not more than a farthing per pound. Should this mode of utilising meat be made public our squatters may probably be able to

turn the more fleshy portions of their animals to greater advantage than heretofore.

RESTRICTIONS ON THE EXPORT OF CATTLE FROM IRELAND.

We have been credibly informed that Earl Mayo has in contemplation the revocation of those Orders in Council relative to the exportation of cattle from Ireland to Great Britain, which are expensive to this country, among which is the examination by portal inspectors of all exported cattle, and he giving a clean bill of health for the same previous to their embarkation; but it is to be hoped that previous to doing so Government will make such arrangements or regulations relative to the movement of diseased cattle as will prevent the extension of infectious and contagious diseases, by the movement of animals affected with them on highways and railroads. The prohibition of the exportation of diseased animals has, within the last twelve months, checked most materially the extension and consequent amount of infectious disease, to the manifest benefit, not alone of stock owners, but also the country in general; and it would be lamentable were the Government, when taking off expensive restrictions, not to avail themselves of the opportunity of making such regulations as would, although entailing no expense, ensure the country a further reduction in the percentage of losses from infectious and contagious diseases of agricultural live stock.—*Irish Farmers' Gazette.*

HOME CATTLE DEFENCE ASSOCIATION.

We made some remarks in *The Field* of November 9th in reference to the objects of the above society, as they were set forth in the published statement which was forwarded for our perusal. In that statement the association proposed the removal of restrictions upon the home cattle trade, the adoption of measures for the preservation of stock from imported diseases, and the establishment of a separate market for the sale and slaughter of foreign animals. In another part of the document allusion was made to the losses which have at different times resulted from the ravages of pleuro-pneumonia and mouth-and-foot disease; both which maladies, it was stated on the authority of Professors Simonds and Brown, have been almost exterminated by the adoption of

those repressive measures which were directed especially against cattle plague, but which, at the same time, operated with considerable effect in preventing the spread of other contagious affections among cattle. Dealing with the statement of the objects of the Home Cattle Defence Association on general grounds, we deemed it necessary to call attention to the fact that the restrictions complained of had already ceased to interfere with the home cattle trade all over the kingdom, with the single exception of the metropolis, which is the real bone of contention, although, for some reason which we do not appreciate, the fact is seldom or never admitted. So far from the admission being detrimental to the cause which the association advocates, it is an argument, it seems to us, in favour of the removal of restrictions from the metropolis, that their revocation has already taken place all over the country, and that no fresh outbreak of cattle plague has been recorded. The difference between the metropolis and other towns in respect to the importation of cattle, is only one of degree. Many more animals are imported into the port of London than into other ports, and the danger of the introduction of foreign disease is therefore so far greater; but if the principle on which the slaughter of foreign animals at the ports of landing is based is correct, it must apply to all ports where cattle are landed. Therefore it is that we do not comprehend why a general proposition should be made to do what has already in great part been done, when a particular proposition in reference only to what has been left undone would be more definite and more true. In our further observations, while admitting the great importance of the objects of the society, the preservation of the health of home stock, the increase in the supply of meat, and its reduction in price to the consumer, we were led to question the efficacy of the means proposed.

Accepting the assertion that "restrictions in the movement of cattle" had directly resulted in the prevention of the spread of pleuro-pneumonia and mouth-and-foot disease among home stock, and knowing that since the free movement of cattle has been permitted the diseases in question have been gradually extending, it seemed to us inconsistent to propose the unconditional removal of those restrictions as "vexatious and injurious alike to consumer and producer." Having before us the fact that these contagious affections were known in England, and that one of them prevailed so extensively as to receive the serious attention of the Royal Agricultural Society, before the passing of the Act admitting foreign cattle into this country, we felt justified in expressing a strong

doubt as to the attainment of a future immunity from these diseases as the result of the establishment of a separate market for the sale and slaughter of foreign stock. Indeed, it occurred to us that in neglecting to suggest means for the eradication of these and other destructive affections which are now naturalised in the kingdom, the Home Cattle Defence Association had been guilty of a serious omission. After this expression of opinions which we still entertain, we are glad to receive a "corrected" statement from the association, in which one at least of our objections is met by a clause to the following effect:

> That, seeing the beneficial results of recent restrictions in checking the ravages of pleuro-pneumonia and other diseases—to render more complete and effective the provisions of the Contagious Diseases (Animals) Bill.

If the estimated annual loss—160,000 head of cattle from pleuro-pneumonia alone from 1854 to 1860—approximates the truth, it certainly would appear to be necessary that some effective provisions should be made to meet the probably, we may say actually, recurring evil; for, in reality, pleuro-pneumonia now prevails to a sufficient extent to excite apprehension, and mouth-and-foot disease has appeared in places which have been comparatively or entirely free for months.

No difference of opinion can possibly arise as to the immense benefits which would be conferred on the public if, by the adoption of any system, we could insure the full development of the import trade, preserve our own stock from the ravages of disease, lower the price of meat, and leave the English cattle trade perfectly unfettered. But we cannot imagine a scheme which will reconcile such manifest contradictions. To secure the full development of the foreign trade we must remove all hindrances to the free movement of foreign animals, and in so doing we place our home-bred stock in jeopardy; a perfectly unfettered trade in English animals will inevitably result in the spread among them of certain contagious affections; while the tendency of restrictions upon the cattle trade is to diminish competition and to increase the price of meat. These propositions are all self-evident, and the mere statement of them compels the conclusion that it is impossible to secure all the advantages, and that one of the objects proposed must be to some extent sacrificed. That one, we unhesitatingly admit, should be the foreign trade. Having the choice of alternatives, we naturally prefer the security of our home breeds, and therefore accept the scheme of isolation, with all the risks and other disadvantages that may attach to it. In our remarks upon the subject of the sale

and slaughter of foreign cattle, in *The Field* of December 14th, we pointed out several channels through which an infectious disease might be conveyed from stock in the foreign to animals in the English market, and this event, transpiring at a time when there were no restrictions upon the movement of the English stock, might grow into a great calamity before it was discovered. So long as the movement of cattle out of a place in which foreign animals are imported is prevented, diseases, if communicated, will be confined to an area of known limits. And in giving up for the convenience of commerce such an important safeguard, it is well that we should do so advisedly, and with a clear appreciation of the risk which will be incurred. The actual danger will neither be augmented nor diminished by the affirmation or denial of its existence; only, if it be recognised, it will be the more easy to meet it effectively. That the establishment of a separate foreign market will give absolute security even against the introduction of foreign infectious disease, is an assertion which is at best open to question. That such an arrangement, by permitting the removal of restrictions upon the movement of English cattle, while foreign stock are confined to a limited area, will confer a great boon upon the producer of home-bred stock, is sufficiently obvious to need no argument; but that the price of meat will under this system become lower is precisely what we should not have expected to follow. A common-sense view of the matter teaches that restrictive measures will have exactly the same influence in diminishing competition, whether they relate to the foreign or the home cattle trade, and in either case they tend to limit the supply. If a butcher can purchase English or Scotch animals, and remove them from the market alive to any part of the country, he is not likely, unless under peculiar circumstances, to buy stock in the foreign market, knowing that they must be slaughtered there, and the carcasses subsequently be conveyed by rail or road to his premises at a distance. It is not improbable that the foreign cattle trade, under the proposed system, will pass principally into the hands of a certain number of large carcass butchers and contractors; and that, in consequence of the decrease in competition, foreign stock will not realise sufficiently remunerative prices to induce capitalists abroad, who supply the funds to enable their agents to buy up cattle in all parts where they may find them, to risk their money in an unproductive enterprise. If the necessary funds are not forthcoming, there will be a considerable falling off in the numbers of animals imported; and with this probability in view

we do not perceive how it can be assumed that the tendency of restrictions upon the foreign cattle trade will be to lower the price of meat. There will be no just cause for complaint if, by the means suggested, we succeed in keeping cattle plague out of the country without seriously diminishing the supply and increasing the price of food for the people.

The resources of our stock-breeding districts will be taxed severely, and there will be a necessity more urgent than ever to protect our herds and flocks from the attacks of diseases of all kinds, and especially by the establishment of some system of supervision to prevent the unrestricted traffic in animals suffering from infectious maladies. With a diminished supply of foreign stock, we shall be ill able to afford the waste of home-bred cattle, and the Cattle Defence Association is pledged to use every effort to avert such a catastrophe.—*The Field.*

THE VITAL FORCE—WHAT IS IT? ARE WE NEARER A SOLUTION OF THE QUESTION THAN WE WERE?

The following is extracted from a lecture by Dr. Letheby in the *Chemical News*:

"We speak of healthy and unhealthy seasons, and in popular discussion are satisfied to refer the pandemic tendency of disease to the state of the weather. But how are they related? The circumstance of a higher or lower temperature than usual, a wetter or dryer season, the existence of more or less ozone in the air, the fluctuations of the barometer, &c., are, at present, but coincidences of facts; and they offer no explanation whatever of the etiology of disease. The same is also true of the observations which have been made concerning the local peculiarities of epidemics—as the altitude of a place, the condition of its soil, the water level in it, and the presence of putrid effluvia. All these, as in the last case, are but dimly seen to have an influence on disease. We know nothing of their real agency, and yet the wildest theories have been advanced in respect of them. At one time it is dogmatically asserted that epidemics are due to wet in the soil; at another to the water supply of the place. Now, it is the condition of the air which causes them, and then it is our filthy habits. Out of this confusion order must come, and the first step must be towards the investigation of the real nature of specific contagia. When this is known, and the laws which govern their

action are determined, the caprices of epidemics will be explained.

"Nor are we much more advanced in the interpretation of healthy phenomena. The fiction of an Archœus, and the mechanical and chemical theories of life, have given place to the dogma of a vital force; but the recent progress of physical science has done much to dissipate our illusions concerning fictitious entities and mysterious forces. The study of physical phenomena, from a dynamical point of view, has led to the recognition of the fact that there is a definite correlation or mutual dependence of physical forces—'that the various imponderable agencies, or the affections of matter, which constitute the main objects of experimental physics, namely, heat, light, electricity, magnetism, chemical affinity, and motion, are all correlated, or have a reciprocal dependence; that neither, taken abstractedly, can be said to be the essential or proximate cause of the other, but that either may, as a force, produce or be convertible into the other; thus heat may mediately, or immediately, produce electricity, electricity may produce heat, and so of the rest.' 'I believe,' says Mr. Grove, from whom I am quoting, 'that the same principles and mode of reason might be applied to the organic as well as the inorganic world, and that muscular force, animal and vegetable heat &c., might, and at some time will, be shown to have similar definite correlations.' This was said almost a quarter of a century ago, and yet we are only just beginning to recognise the truthfulness of his hypothesis. A former teacher in this school, Dr. Carpenter, whose large acquaintance with physiology and physics especially qualify him for a searching examination of this subject, has fully confirmed the views of Mr. Grove. He has established the fact that there is not only a mutual relation between the so-called vital forces, which are concerned in the growth, multiplication, and transformation of tissues, in secretion, in muscular and other organic motion, and in nervous action, but that there is also a like relation between vital and physical forces. Believing with Mr. Grove that all these forces are but different modes of action of one and the same agency, he contends that the differences of action are due to the material substratum or medium through which it acts; 'that operating through inorganic matter it manifests itself in electricity, magnetism, light, heat, chemical affinity, and mechanical motion; but that when directed through organised structures, it effects the operation of growth, development, chemico-vital transformations, and the like; and is further metamorphosed, through the instru-

mentality of the structures thus generated, into nervous energy, and muscular power.' So that it is the speciality of the material substratum, thus furnishing the medium or instrument of the conversion or metamorphism of force, that marks the differences between physical and vital phenomena. I believe that the time is fast approaching when all special entities for the explanation of physical and physiological phenomena will be dispensed with, when the fundamental conceptions of matter and motion will be found sufficient for their explanation.

"In the case before us, it is not necessary to suppose that a living cell or primordial germ contains within itself, in a latent form, the whole organising force which is required to build up the future plant or animal. Nor is it necessary to believe that vital force exists in a dormant condition in all matter that is capable of being organised, and that the living cell, in growing and multiplying, evokes and utilises it. It is enough that the cell is the medium for the conversion or metamorphosis of external physical forces into what are called vital actions.

"The external force which the cell chiefly converts is heat; and Dr. Carpenter lays so much stress on the dependence of the organising forces of both plants and animals, on the continual agency of heat, that he regards their vital action as the correlation of it. It might, indeed, almost be said that the special and distinctive attribute of a living organisation is the power of converting heat into vital force. In plants it is entirely exercised in the growth and transformation of tissue; but in animals it is also rendered subservient to the production of nervous and muscular forces; and these manifestations of action are always exhibited in tissues, which retain their original cellular constitution. It is remarkable, too, that no cell has the power of performing two different operations at the same time: thus, says Dr. Carpenter, the *assimilating cells*, whose function it is to convert the raw material supplied by food into organisable *plasma*, exercise little or no chemical transformations; they do not undergo change of form; they do not exert any mechanical or nervous power, and they do not reproduce their kind. So, again, the cells which are specially endowed with the powers of *multiplication*, as well as those which are engaged in *reproduction*, have in each case no other vital endowment. It is the same with the *secreting* cells, and with the cells that are concerned in the production of *mechanical movement*, as the contractile cells of muscular fibrillæ, the ciliated cells of respiratory and other passages. Perhaps, also, it is the same

with the cells, or cell-nuclei of the *ganglia,* and extremities of nerves which in all probability are the agents of *nerve-force.* This faculty of exercising but one function at a time is a marked peculiarity of physical forces. If, for example, the force derived from chemical action in a galvanic battery be made to act on a fine platinum wire, it will show itself as *heat;* or if it be conducted through a coil of wire placed around a piece of iron, it will exhibit itself as *magnetism;* or if it be conveyed through acidulated water, it will appear as *chemical action;* but all these manifestations of it cannot be fully exerted at the same time. There is, consequently, a certain quantivalence of action; in fact, the idea of the correlation and mutual dependence of forces involves the necessity of a certain definite ratio or equivalence of action; for as force cannot be created or destroyed, it must ever be acting in some fixed proportion. If, therefore, the heat and light force received by the plant be converted into vital force during the growth and transformation of tissue, there must be a quantivalence of action, and the force must endure. While the cell lives it is exerted in the manifestations of vital phenomena, but when it dies and decays it is converted into chemical action, and then into heat and sometimes light. In the case of the plant the transformation of heat force is chiefly concerned in the production of tissue; and so also in the animal during the processes of growth and repair; but when the latter engages in the main duties of its existence—the development of motion, it resorts to the affinities of its food, and as these are the embodiments, so to speak, of the light and heat, through whose agency they were formed, it may be said that the functions of the animal body are performed through the agency of cosmical force. The plant is the machine or medium whereby light and heat are converted into the force which forms tissue, and the animal is the machine or medium for changing the affinities of the tissue into other manifestations of force, and finally into heat. The one is accompanied by processes of deoxidation, and the building up of compounds; the other by processes of oxidation and pulling down, but throughout the whole of these changes there is the same force operating through different media.

"It follows from this, that there must be some definite relation between food and animal force. Hitherto it has generally been thought that the nitrogenous element of food is the exponent of its value, and that there is a direct relation between the waste of muscular tissue and the amount of work performed. Attempts have, therefore, been made to

estimate the relation by observing the amount of nitrogen excreted, as urea, during exercise of different degrees of activity. The results, however, have shown that, under the best circumstances, the actual work performed exceeds that produced by the oxidation of the nitrogenous constituents of the food and worn-out muscle by more than thirty per cent., and in some experiments which were made in 1866, by Drs. Fick and Wislicenus of Zurich, when they ascended the Foulhorn, which is 2000 feet above the Lake of Brienz, in Switzerland, it was ascertained that the amount of work done in climbing the mountain exceeded by more than three fourths that which it would have been theoretically possible to realise from the oxidation of muscle, as indicated by the quantity of urea in the urine. Consequently they conclude that muscular force is chiefly, if not entirely, derived from the carbo-hydrogen of our food, and that the muscle is no more than the machine for the production of motion. Like a steam-engine, it converts the affinities of the oxidised fuel into heat, and then into visible motion. Like it, also, its movements must cause decay and necessitate repair. The nitrogenous constituents of our food are chiefly concerned in this last process, and it is very doubtful whether as much force is not expended in this process, as is afterwards produced by the oxidation of the worn-out tissues. In the consideration of this subject, however, we must not lose sight of the fact that there is a difference between sustained and temporary muscular activity. The herbivora, as the horse, the chamois, the stag, &c., are capable of great temporary exertion, but they are not equal to the carnivora for sustained energy; and with our own domestic animals, we find that they are capable of performing most work when they are supplied with vegetable food containing much nitrogen.

"Lastly, I will remark, in illustration of the general tendency of physiological pursuits, that great efforts are being made to determine the constitution as well as the composition of the fluids and tissues of the living body; for there has long been a desire to understand the way in which the common affinities of matter are controlled by the living cell. Broadly, the chemist has ascertained that the chemical functions of the plant are those of reduction or de-oxidation, whereby carbonic acid and water lose oxygen, the residual elements with the nitrogen of ammonia forming tissues. The functions of an animal, as I have said, are of an opposite nature, for instead of building up they pull down; and in using the tissues of plants as food they oxidise them, and finally restore them to nature as carbonic acid, water, and

ammonia. 'The two extremes of these changes are,' to use the words of Gerhardt, 'carbonic acid, water, and ammonia at one end; albumen, gelatine, fat, and cerebral matter at the other;' but the transitions to these extremes are countless, and are as yet almost beyond the ken of science. Who can tell us by what series of transformations the carbonic acid water, received by the plant, are converted into vegetable acids, sugar, and fat? And still more mysterious are the phenomena which accompany the formation of tissues. Why is it that a living cell, as we call it, possesses the power of transforming cosmical forces, light and heat, into cell-force; and in aggregating matter, how is it that it keeps common affinities at bay? That when it dies, as we express it, the matter so aggregated during life, decays, and comes again within the reach of ordinary affinities? What answer can we give to these questions? No other than that organic matter is the designed or appointed medium of these changes; and we can no more explain the phenomena than we can say why it is that mineral matters are the appointed media of other manifestations, as light, heat, magnetism, and electricity. Such questions are beyond the scope of the human intellect, and mark the limit of our understanding.

"Apart from these questions, however, the chemist has hope that he will penetrate the mystery of organic changes, in so far as the chemical combinations are concerned. Already he has found the clue to many of the vegetable processes of reduction, and has been able to produce a large number of organic compounds from carbonic acid, water, and ammonia, and even from the elements themselves: in fact, of the three great classes of alimentary substances, as Dr. Odling says, the production of the oleaginous is quite within his reach; the saccharine is almost within it; but the albuminous is still far beyond it. He has thus proved that the dogma of a vital force, which has tyrannised so long over men's minds, has no foundation; for a host of organic compounds can be made artificially.

"And then with regard to the processes of oxidation, which characterise the functions of animals, he has been able to imitate them to a much larger extent; for, by subjecting organic compounds to chemical transformations, he has produced a multitude of secondary products like those of the living world; recognising the fact that all secondary products of tissue-transformation are compounds of comparatively simple molecules, the chemist has been able, not only to classify them into certain definite groups, but he has also been able to construct them after the fashion of organic nature.

Stearin has been produced by joining the residues of glycerine and a fatty acid. *Sarcosine,* which is a muscle-product, by putting together the residues of acetic and methylamine. *Hippuric acid,* from the residues of benzoic acid and glycosine. *Taurine,* which is a constituent of bile, from the residues of isethionic acid and ammonia. *Urea,* from the residues of carbonic acid and ammonia, and so of many others.

"In this way 'organic chemistry has achieved,' as Dr. Odling truly observes, 'a great *analytical* success. The compounds so elaborately built up by the living organism, it has pulled to pieces, and the pieces themselves it had arranged into natural series and groups of associated bodies.' It has also effected *synthetical* processes, and has built up organic compounds from mineral elements; and its hopes are that the entire processes of organic nature, short of making tissue, will ere long be seen and imitated. Presumptuous man! it may be thought, are you not striving for the impossible? In these explorations of vital phenomena, are you not trespassing upon holy ground? Can the finite measure the depths of the infinite? Already we have done so. 'The being of a day has pierced backwards into primæval time, deciphering its subterranean monuments, and inditing its chronicle of countless ages. In the rugged court and shattered pavement of our globe, he has detected those gigantic forces by which our seas and continents have changed places; by which our mountain ranges have emerged from the bed of the ocean; by which the gold and silver, the coal and the iron, and the lime, have been thrown into the hands of man as materials of civilisation, and by which mighty cycles of animal and vegetable life have been embalmed and intombed.' 'He has ascended the Empyrean, and by steps of physical research has reached the visible boundaries of the universe, and has scanned with eagle-eye the mighty creations in the bosom of space. He has marched intellectually over the mosaics of sidereal systems, and has followed the adventurous Phæton in a chariot which cannot be overturned.' 'Ideas like these, when first presented to a mind thirsting for knowledge, are apt,' says Sir David Brewster, from whom I am quoting, 'to disturb its equilibrium and unsettle its convictions. Should this be the mental condition of any one of you, be not alarmed for its results, for this species of scepticism is the infant condition of the uncurbed and generous intellect. There can be no convictions where there have been no perplexities and doubts; and that faith which comes in the train of early scepticism will finally rest upon an immovable foundation.'

"'Credulity, on the contrary, is a disease of feeble intellects and ill-regulated minds. Believing everything, and investigating nothing, the mind accumulates errors, till its overgrown faith o'er-masters its untutored reason. Such a facility of belief may in some cases claim the sympathy even of philosophy; but when it spurns the strict demands of inductive truth, and plants imagination at the door of the temple of science, it cannot be too severely reprobated or too sternly shunned.'"

IRRITABILITY OF PLANTS.

We have undertaken during the present year, a number of experiments on the irritability of plants, which show that the faculty which some of them, and especially the sensitive plant, possess of executing movements which appear voluntary, may be suspended by many agents, such as ether, chloroform, carbonic oxide, and spirit of turpentine, all of which are known to act upon the nervous system of animals. Among these experiments there is one that appears to us of sufficient interest to deserve the attention of the Academy of Science; it relates to the action of the electric current on the *Mimosa pudica* (sensitive plant). We selected four plants perfectly developed, and so sensitive that the slightest contact, such as the friction of a fly's wing, caused their leaves to shut up, and the petioles (leaf-stalks) to droop along their stems. Placing the pots containing these plants on an insulating stand, we attached to the two ends of their stems a small copper wire, in order to pass through them the current from a single Bunsen's cell. After a few seconds, when the plants reopened their leaves, and erected their petioles, we caused the current to traverse them; but the leaves did not fold up, the petioles did not fall, and the plants seemed insensible to the electric action. We then varied the experiment, and instead of employing the direct current of the battery, we used an induced current obtained by the aid of a very small Ruhmkorff's coil. The results were then quite different. Scarcely had the current commenced when the leaflets began to fold together, and the leaf-stalks drooped down along the stems. These movements were quickly propagated from one end to the other of the plants. According to this experiment the plants are sensible to electric disturbances, and behave under such conditions like animals. We then wished to see whether the application of the electricity for a longer or shorter time would give rise to any special

phènomena, and we exposed three of the plants to electric action for varying periods. The first plant received the current from the Ruhmkorff coil for five minutes, and was then left to itself. For more than a quarter of an hour it remained in a state of prostration, but gradually its leaflets re-opened, the leaf-stems lifted themselves up, and in about an hour it reassumed its natural appearance and seemed none the worse for the shocks it had received. A second plant was similarly treated for ten minutes, and then left alone. The state of prostration in this case lasted for an hour, and it was not till the expiration of that time that the leaflets began to open, and the leaf-stalks to rise, and these movements seemed to be accomplished with greater difficulty than in the preceding case. The plant was evidently fatigued, and did not fully recover for two hours and a half. The third plant was electrified for twenty-five minutes and then left to itself. In this case we waited in vain for its restoration—the prolonged electric action had destroyed its irritability, and even its life, for the next day we found it withered, and blackened, as if struck by lightning. The fourth plant was reserved for an experiment, which proves that electric disturbance acts upon plants as it does upon animals. It is known that man, and other animals, exposed to the anæsthetic action of ether, become insensible to induction currents, even when strong. We desired to ascertain if it was the same with the sensitive plant. With this object in view we placed a plant under a bell-glass with two openings, through which two copper wires could convey the electric current to it. A few drops of ether were sprinkled in the glass, and in a short time the plant experienced the anæsthetic action of that substance, for when shaken it did not close its leaves, or manifest any sensibility. In this state we passed the induction current through it, but it gave no sign of sensitiveness. The petioles remained straight, and the leaflets continued open. These fresh experiments came in aid of others which have been made on the same subject, and supply an argument in favour of those who consider the movements observed in these plants to be produced by the operation of organs analogous to those which animals possess.—*Gardener's Chronicle, from 'Comptes Rendus.'*

ON THE EMPLOYMENT OF NUX VOMICA IN DYSENTERY AND IN DYSENTERIC PARALYSIS.

By Dr. De Savignac.

In an interesting paper Dr. D. de Savignac discusses the value of nux vomica in the treatment of dysentery, and of the general paralysis that frequently accompanies the chronic forms of this disease. He has had ample opportunity to study the disease in L'Hôpital Maritime de Toulon; and he has already advanced the theory that the symptoms of dysentery are due, in the first place, to an affection of the spinal cord, which causes paralysis of the motor nerves of the muscular coat of the large intestines, and of the vaso-motor nerves that supply its blood-vessels. He regards the general paralysis of the chronic form as another effect of the central nerve lesion. In support of this theory, several cases are given and others referred to, in which pathological changes in the spinal cord, of the nature of softening, were found at the autopsies. Nux vomica possesses many therapeutical effects that admirably apply to this view of the causation of dysentery. It stimulates the motor nerves of the intestines, and removes the paralysis of this viscus; it increases the tone of the intestinal blood-vessels, and diminishes or stops the abnormal excretion from the mucous surface; it re-establishes the normal neurility of the constrictor ani muscle, and control over defæcation is gradually reacquired: and from these effects there result cessation of colic and tenesmus, diminution in the frequency of the stools, and a modification in the character of the defæcations. At the same time, the action of the remedy on the spinal cord removes the paralysed condition of the limbs. In such chronic cases of dysentery Dr. Savignac prefers the powder of nux vomica (a form not recognised in the 'British Pharmacopœia) to all other preparations of the remedy. He administers from three to seven grains in the twenty-four hours, and usually combines it with canella powder, whose aromatic and tonic properties are useful in diminishing the intestinal flux.—*Bull. Gen. de Thérap.*, Sept. 15, 1867, p. 193.

ROYAL COLLEGE OF VETERINARY SURGEONS.

QUARTERLY MEETING OF THE COUNCIL, HELD JAN. 8TH, 1868.

PRESENT:—The President, Professors Simonds, Brown, and Gamgee; Messrs. J. C. Broad, Cowie, Ernes, Goodwin, Gowing, Harpley, Harrison, Hunt, Hunting, Lepper, Moon, Thacker, Wilkinson, Withers, and the Secretary.

The President in the Chair.

The minutes of the preceding meeting were read and confirmed.

Two new works, entitled 'Brande and Taylor's Chemistry,' by Dr. A. S. Taylor, and a new edition of 'Veterinary Pharmacy,' by Professor Morton, were laid upon the table.

It was moved by *Mr. Wilkinson*, and seconded by *Mr. Harpley*—

"That a vote of thanks be given to Dr. A. S. Taylor and Professor Morton for their valuable contributions to the library of the College."—Carried.

Letters were read which had been received from Messrs. Crowhurst, M.R.C.V.S., Brothers, Canterbury, enclosing a letter from Mr. Lord, Army Veterinary Surgeon, relative to an alleged interference on his part with the private practice of these gentlemen.

After some discussion the Secretary was instructed to inform Messrs. Crowhurst that the Council regretted that they have no power to interfere in the matter.

A letter was read from Dr. J. W. Begbie, Physicians' Hall, Edinburgh, tendering his resignation as a member of the Scotch section of the Court of Examiners.

It was moved by *Professor Gamgee*, and seconded by *Mr. Wilkinson*—

"That the President and Secretary prepare a letter expressive of the deep regret of the Council that Dr. Begbie's eminent services were no longer to be secured for the Board of Examiners in Scotland, but that before accepting his resignation the Council hoped that Dr. Begbie would either state his reasons for retiring or reconsider his resolution."—Carried.

A letter was next read from Mr. Edward Barron, of Dublin, who was a candidate for the diploma of the Royal College of Veterinary Surgeons, but who had unfortunately lost the Highland and Agricultural Society's certificate, requesting to have a written examination.

It was resolved: that Mr. Barron furnish a satisfactory proof that he had been educated at the Edinburgh Veterinary School, and obtained the Highland and Agricultural Society's certificate, and that on this being done he would be allowed a written examination.

The Secretary reported that six candidates, late pupils of the Royal Veterinary College, London, had been admitted members of the body corporate, also three candidates holding the Highland Agricultural Society's certificate, the latter gentlemen having passed their examination before a committee of the veterinary members of the Court of Examiners. The names of the successful candidates were read together with those of the non-successful, and also those of the examiners and *ex-officio* members who were present at the meeting.

Letters were read which had been received from the father of a rejected candidate, educated at the Albert Veterinary College, who having paid the necessary examination fee required by the Royal College of Veterinary Surgeons, requested that it might be returned on account of the severe indisposition of his son. It appeared that this request had been acceded to under the sanction of the President.

It was suggested that the candidate should have been informed that he would be allowed to present himself on a future occasion rather than having the fee returned, as this might prove a bad precedent for future action.

A letter was read from Mr. John Cairns, of Easington, Demesne, Belford, asking to be informed whether Mr. W. Kitching was a member of the Royal College of Veterinary Surgeons, and at the same time requesting that he might be furnished with a copy of the register.

The Secretary informed the Council that he had forwarded a copy of the Register with his reply, that Wm. Kitching was not a member of the profession.

A letter from Mrs. Greenhill, of Kennington Park, was also read, requesting to be furnished with a certificate of her husband, who was residing in Calcutta, having been admitted a member of the Royal College of Veterinary Surgeons, and also asking for the date of his diploma.

The Secretary stated that he had written in reply that no certificate could be granted, and suggested that a copy of the Register would probably answer her purpose.

A second letter from Mrs. Greenhill was read to the effect that she would gladly avail herself of the suggestion in order to obtain a satisfactory proof that her husband was a member of the Royal College of Veterinary Surgeons.

The Registrar reported the following deaths, viz., Mr. John Siddall, Principal Veterinary Surgeon to the Bengal Presidency, diploma dated Nov. 24, 1841; Mr. Robert Lucas, of Liverpool, diploma dated Dec. 14, 1835; Mr. Roger Hampson, of Bolton, Lancashire, diploma dated May 17, 1855; and Mr. Thomas Marshall, of Glasgow, diploma dated April 15, 1867.

Attention was directed to an error in the Register, viz., that Mr. James Burt, of the Royal Artillery, reported as dead, was still living, and had attained a very advanced age.

The Finance Committee reported that they had examined the vouchers and receipts of payments for the preceding quarter, and found them correct. The quarterly balance sheet of the Treasurer's account was submitted. The current expenses for the quarter amounted to £68 0s. 7d., which the committee recommended should be discharged.

It was moved by *Mr. Hunt,* and seconded by *Mr. Gowing*—

"That the Report and the Treasurer's quarterly balance-sheet be received and adopted."

Cheques were ordered to be drawn for the current expenses.

The Secretary informed the Council that he had forwarded to the Lord President of the Board of Trade a memorial which he had received from the President of the North of England Veterinary Medical Association, objecting to the granting of a charter to Scotland.

A letter was then read from Mr. Thomas Greaves, of Manchester, containing an account of the proceedings of the opening session of the Edinburgh Veterinary College, and also of a subsequent meeting which he attended, and at which the Lord Provost of Edinburgh received a deputation from the West of Scotland Veterinary Medical Association.

The Parliamentary committee reported "that in consequence of a communication which the President had received from Messrs. Loch and Maclaurin, the parliamentary agents, on the desirability of an influential deputation being appointed to wait upon his Grace the Duke of Richmond, in order to urge objections against the granting of a charter to Scotland," a deputation from the Council of the Royal College of Veterinary Surgeons had had an interview with his Grace at the Board of Trade, on Thursday, November 28th, 1867.

The deputation was introduced by C. N. Newdegate, Esq., M.P., and Edward Holland, Esq., M.P.

The deputation consisted of the President, W. Field, Jun., Esq., J. Wilkinson, Esq., Principal Veterinary Surgeon to the Army, Professors Spooner, Simonds, Gamgee, and McCall; Messrs. J. C. Broad, Cowie, Ernes, Goodwin, Gowing, Greaves, Harrison, Lawson, Lepper, Moon, Robinson, Withers, and the Secretary.

His Grace was addressed at considerable length by Messrs. Newdegate and Holland, and also by Professors Spooner, Gamgee, and McCall; Messrs. Wilkinson, Cowie, Lawson, Robinson, and others.

The Secretary next proceeded to read a circular letter, and also a copy of a memorial which some of the Scotch members were about to forward to the Board of Trade.

It was moved by *Professor Gamgee*, and seconded by *Mr. Hunt*—

"That the documents in question be referred to the Parliamentary Committee."—Carried.

Professor Gamgee directed the attention of the Council to the present character of the examinations with a view to the adoption of measures whereby the efficiency of Veterinary Surgeons might be increased, and a higher class of qualification adopted.

It was then moved by *Professor Gamgee*, and seconded by *Mr. Ernes*—

"That the proposed amendment in the examining bye-laws be suspended in the board-room for three months, and discussed at the next meeting of the Council."—Carried.

By order of the Council,

WILLIAM HENRY COATES,

Secretary.

VETERINARY MEDICAL ASSOCIATION.

AT a meeting of the Council of the Veterinary Medical Association, held on January 29th, the following gentlemen were awarded certificates of Honorary Fellowship for essays which they had read during the past session:

Mr. O. W. G. Brown.	J. Barnett.
J. L. Cassel.	R. Gibbs.

J. A. Collings.

NORTH OF ENGLAND VETERINARY MEDICAL ASSOCIATION.

ON VETERINARY SURGERY AND THE ALLIED SCIENCES.

By R. Brydon, Pensher.

(*Read at the Meeting of the North of England Veterinary Medical Association.*)

(*Continued from p.* 65.)

Hardy constitutions are now discarded, and preference is given to fine delicately-bred animals, showing a greater aptitude to fatten. These are kept in warm houses, fed, in too many instances, on a too liberal allowance of some over-stimulating artificial food; in short, every means is tried to force them quickly to maturity. Many animals can stand this treatment with impunity, but in others it induces disease. But we need not be confined to this solitary example. Many diseases might be alluded to, entirely caused by what may strictly be termed agricultural improvement. It is only within the last few years a disease has appeared in lambs, in certain parts of the country, popularly known as nipple-back. The primary cause of this appears to be the liming and otherwise improving of their poor mossy moorland, enabling it to carry five or six times the original quantity of stock. The immediate cause, I believe, to be a deficiency of phosphates, as on subsequent application of large dressings of dissolved bones in many cases it has disappeared. In a large district, like A, a veterinary surgeon with a fair amount of perseverance can do pretty well. It is true we are only sent for in the worst cases, but these are of frequent occurrence. The fact is, the farmers do not place in us that amount of confidence we have a right to expect. Of the accuracy of this statement, the way we were treated in 1865, at the outbreak of the cattle plague, is a very conclusive proof, and there is plenty similar evidence at the present day. Only consider for a moment the enormous loss the country yearly sustains, by the death of animals from preventible diseases, and how seldom we are consulted with a view of reducing the mortality, and yet in this capacity our services are far more valuable than in that in which they are generally employed. For this unsatisfactory state of matters the farmers are not altogether to blame; certainly a portion of the fault belongs to them, but by far the greater part lies at our own door. During the last half century farmers have made great advances, not only in improved husbandry, but in general education; veterinary surgeons have also improved, but not in a corresponding ratio. Now we must not only regain the lost time, but keep advancing with the age. When it is considered necessary that farmers should study veterinary surgery, surely it is equally necessary that veterinary surgeons should study agriculture. They should become acquainted with all its general principles, so that they not only

can talk intelligently on things connected with their own profession, but on agriculture as well. Through this knowledge they would find a means of introduction and a way of gaining the confidence of the farmers, which no other acquirement could surpass. It would also enable us to take an interest in the farmers' clubs, at the meetings of which every veterinary surgeon should be a constant attender; there he would have many opportunities of enforcing on them the advisability of paying for the prevention, rather than the cure, of disease, and of discussing many other important matters of equal interest to the farmer and himself. In regard to payment, instead of getting our money out of medicines, we should either charge a regular professional fee, or contract at so much per head per annum. This last is an excellent system, and having seen its practical working in a country district, I cannot speak of it in terms of too high praise.

I now come to my third heading, and will briefly consider the relation of veterinary surgery to agriculture, as it may be in the future. Of course, this being a matter of supposition and conjecture, it must be taken only for what it is worth. We have seen pretty clearly that we have not been keeping up with agricultural improvement, and unless we soon take some decided step in the right direction, the present unsatisfactory state of matters will be aggravated. To prevent this, the period of study at college should be lengthened, a preliminary examination introduced, and a strict final examination, written, oral and practical, enforced. By these means better men generally would be admitted into the profession, its respectability would be increased, and its general status raised. I look forward to the time when every local farmers' club in the kingdom will have its special veterinary surgeon, whom they no more would think of being without than without a secretary. I look forward to the time when the veterinary surgeon will be a weekly visitor at all the farms in his district, going through and looking at the general health of the stock, and consulting with the farmer on all matters connected with breeding, feeding, and purchasing, and this in reference not only to horses and cattle, but to sheep as well. The diseases of the latter class of animals, so little attended to at present, should be made a special study, especially as to the means of prevention. The immense loss from disease in sheep cannot long be allowed to go on unheeded, and I believe the time is not far distant when sheep practice will be as remunerative as any other. If the changes which I have merely indicated were brought about, the farmer and veterinary surgeon would go hand in hand, their interests would be identical instead of being opposed as at present, and the best of fellowship would exist between two classes which at present, in too many instances, look on each other with distrust.

For bringing about a better understanding between the farmer and veterinary surgeon, Professor Gamgee, among others, has done much. 1st, by writing and giving addresses on the subject; 2nd, by establishing a periodical for the perusal of both; and 3rd, by establishing

an agricultural chair in his college. In all movements for our general good, he is usually first at the helm, and were the course only steadily followed, a brighter era would soon dawn on the veterinary profession.

I now come to the next part of my subject, namely, chemistry. Every veterinarian should endeavour to have as complete a knowledge of this science as possible, whatever trouble it may cost him, for no other science will repay him better for the time and expense spent in its acquirement; and if we wish to experience the full benefit, we must not be satisfied with getting up the theory alone, but must work in the laboratory and go through a thorough course of qualitative analysis, which prepares us for undertaking the more interesting, though perhaps, for our purposes, less important quantitative analysis.

The advantages of a sound knowledge of chemistry to the veterinarian can scarcely be over-estimated. Hardly a day passes in the practice of our profession, but we meet with a case or have to perform an act or operation, the success of which entirely depends on a correct knowledge of the chemical changes involved. I need not here occupy your time by particularizing its immense use in the prescribing and compounding of drugs; its importance in this respect must be obvious to all. I have the authority of several dispensing chemists for stating, that the number of prescriptions containing incompatibles they get to make up from medical men, in many cases standing high in their profession, is almost incredible. These things, for interested motives, are generally kept quiet, but there is no doubt they are the cause of many a dangerous and, it may be occasionally, a fatal result.

I suppose you have all heard the story of a Bathgate doctor, who treated a patient with diarrhœa at the same time with sulphuric acid and magnesia, the effect of which may be easier imagined than described. As veterinarians usually compound their own medicines, we can't say to what extent the use of incompatibles prevails, but reasoning from analogy I am afraid we can't claim any superiority over our medical brethren in this respect.

I have given one or two instances where a thorough knowledge of theoretical chemistry is important, and will now enumerate a few of the cases where its practical and analytical departments come most usefully to our aid. We are often called to cases previously treated by a quack, and find the animal showing symptoms which puzzle us whether to ascribe to the disease itself, or to the nostrums which have been used for its cure. If any of the latter are left, our knowledge of testing or analysis would be of great advantage, or if not, the same knowledge might be applied to the examination of the urine. The analysis or testing of this last secretion is of immense importance in disease, and is now much resorted to in medical practice, with very satisfactory and surprising results. Of course its practical application is much easier in the case of the medical man than with the veterinarian, yet in many cases the latter might have recourse to it

with great advantage. But it is not in analysis of the urine alone that we derive benefit from chemistry, as all the solids and fluids of the body can be brought equally under its subjection. By its aid we can detect the various accidental or intentional impurities of our drugs, and from it we learn how they may be purified. Its immense importance in cases of poisoning, for detecting the agent used, must not be omitted; and last, but by no means least, by it we are enabled to ascertain the chemical composition of the various foods consumed by man and the domestic animals. On this knowledge is founded the fundamental laws of our system of hygiene, and also by it we can arrange the diet to suit any particular disease.

Before leaving the subject of chemistry, permit me, gentlemen, shortly to glance at the discoveries in this science in recent years, more particularly those relating to the practice of medicine. Doubtless, to many of you they are familiar; at the same time others, through the pressure of business and other causes, are often deterred from keeping up with the discoveries of the day, and for the sake of the latter I take the liberty of alluding to them here. Within the last few years two new modes of analysis have been discovered, which bid fair to be important aids to the chemist in the investigation of substances. One of these—spectrum analysis—depends on the various elementary bodies, producing certain lines or bands when burned in a flame, which is decomposed by a prism and the spectrum obtained. The other mode, termed dialysis, is dependent on the law of diffusion of liquids, and by it chemical substances are separated from each other, by allowing solutions containing them to pass through a diaphragm or septum. The powers of spectrum analysis have been taken advantage of in the examination of blood. Hoppe and Stokes have shown that when a ray of light is transmitted through a tube containing a mixture of blood and water, and afterwards through a prism, the spectrum obtained consists of a number of dark bars or spaces; these differ according to the quality of the blood, whether venous, arterial, &c. This property has been taken advantage of, and applied by Sorby in the examination of blood-stains in criminal cases, and it has been suggested that it might be used as a means of investigating the blood in health and disease. Interesting as spectrum analysis may be in a medical point of view, dialysis seems to surpass it. Much light has been thrown on the laws of the diffusion of liquids by the researches of Professor Graham, Master of the Mint. The simplest arrangement for observing the diffusion of liquids is a tall glass jar, mostly filled with water, to the bottom of which a solution of some substance is introduced by a long pipette. Some substances diffuse through the water with great rapidity; others take a long time. Professor Graham, who has made elaborate experiments on the whole subject, has shown that of the substances tried by him hydrochloric acid diffused most quickly, and albumen and ceremel required the longest time. Supposing the temperature and other circumstances to be as nearly equal as possible, the following shows the time required for the diffusion of a few common substances.

Thus hydrochloric acid diffused itself through the upper column of water in a time represented by 1·00, common salt took 2·33, Epsom salts 7·00, albumen 49·00, and ceremel 98·00. These substances, which diffuse rapidly, Professor Graham calls crystalloids, and those of slow diffusibility colloids.

By means of dialysis substances dissolved in a liquid can be separated from each other by allowing them to pass through a diaphragm. Parchment paper makes the best diaphragm, but it is not the only one that will answer the purpose. The diaphragm is placed between two vessels, the upper one containing the substance to be dialysed, and the lower containing water. The class of substances termed crystalloids are soon found in the water underneath; these are represented by acids, alkaloids, and metallic salts. The colloids, on the other hand, pass through the septum very slowly; such substances as gelatine, album, casein, and ceremel represent this class. It will at once occur to you that by this means a crystalloid and a colloid may be easily separated when in solution in the same liquid, and this is exactly the circumstance we have to deal with in all cases of poisoning, as all poisons, both organic and inorganic, are crystalloids. Arsenious acid and porter have been mixed and thrown on the dialyser and when more than half the poison had passed through, only a faint yellow colour stained the water. By this means arsenic has been separated from blood, and from the contents of the stomach and intestines. Dr. McHattie, of Glasgow, has suggested that in cases of poisoning, instead of using the regular dialyser, that the stomach and intestines be taken, their openings secured and suspended in a vessel of water, into which the crystalline poison would dialyse through the membranes of the organs used. Mr. Whitelaw, of Glasgow, has suggested that dialysis should be taken advantage of in the utilization of the large quantities of brine from salted meat, at present thrown away. The crystalloid chloride of sodium would quickly pass through the membrane, and the colloid extract of beef would be left behind, and thus from the worthless brine we obtain the useful substance, common salt, and the valuable extract of beef.

The process of dialysis throws much light on the physiological changes which occur in the animal economy, and no doubt it influences and regulates the changes of position of matter, and the diffusion of substances through the animal system.

Dr. Stevenson Macadam has suggested the use of a coating of solid paraffin in the preservation of museum specimens, and as it is not liable to oxidation, I have no doubt it would answer the purpose well.

Sanitary chemistry has recently received much attention, and great progress has been made. Dr. Angus Smith, of Manchester, has published an elaborate series of observations on the proportion of oxygen and carbonic acid in the air, in different districts and in various circumstances. For the estimation of the carbonic acid, Dr. Smith invented a simple and most ingenious instrument. It consists of a small bottle and compressible ball, connected by a tube.

A measured quantity of baryta water is placed in the bottle, and air is drawn through the water by compressing the ball, and by the number of compressions necessary to cause a distinct precipitate in the water, the purity of the atmosphere is determined. Dr. Macadam, for several years back, has been making extensive investigations on the purity of water supplied to towns for diatetic purposes. More recently he has been engaged in examining the water of Leith, which conveys to the sea nearly two-thirds of the Edinburgh sewage. On this subject he has published a pamphlet, in which he gives much valuable information. The presence of organic matter in waters cannot at all times be detected by appearance, taste, or smell. In many instances the water is clear, has an agreeable taste, and no odour. This is the case when the organic matter is completely decomposed, which leads to the formation of nitrates, which are dissolved in the water. In consuming the organic matter, the water is robbed of much of its oxygen, which all healthy waters hold in solution, and the water now acquires the power of acting more powerfully on lead, and may do so to a dangerous extent when conveyed in lead pipes, or stored in lead cisterns. Four causes, therefore, render contaminated water unwholesome—1st, the presence of free organic matter; 2nd, the presence of nitrates; 3rd, the absence of oxygen; and 4th, its increased power of acting on lead. A simple process for detecting the presence of nitrates is to boil forty ounces of the suspected water down to half an ounce, then add half its volume of sulphuric acid, and put in a piece of copper foil, and if nitrates are present, you will get the ruddy fumes of nitric oxide; if the quantity of the gas be so small that you can scarcely see it, either by looking across or down the tube, if the liquid is blue, nitrates are present.

Disinfectants and antiseptics have recently been made the subject of much investigation. Many new agents for this purpose have been introduced, and the worthlessness, or at all events insufficiency, of others established. The most important now in use are chloride of lime, carbolic acid, and McDougall's disinfecting powder. The permanganate of potash is chiefly valuable for the disinfecting of clothes, which, when treated with the fluid, lose all disagreeable odour, and the cloth is not injured. Charcoal, if spread over putrefying matter, not only absorbs all the escaping gases, but hastens its decay. Of all disinfectants, perhaps the mere application of heat, at a temperature, ranging from 210° to 220° Fahr., is the most effective and certain in its results. The difficulty of its application renders it seldom resorted to in veterinary practice.

In organic chemistry also much progress has been made. The chemist can now manufacture organic compounds without having recourse to either the vegetable or animal kingdom, which, till within the last few years, was regarded as their only source. Glycerine, grape sugar, alcohol, and prussic acid, may be mentioned as examples of organic compounds, artificially produced, and every year the number receives important additions. It has been calculated that by merely following out the present modes of research, several

sextillions of organic bodies may be discovered. The new notation has made great alteration in the symbols and combining weights. It was originated by Gerharde, a French chemist, who desired to reconcile and equalize the combining volume of all elements, with their combining weight. It has led to the better understanding of groups of substances, especially those in organic chemistry.

I now come to Botany, and with it I must be brief, not because it is not of sufficient importance for a lengthy consideration, but because the limited time at our command, and the number of subjects to be got through, will permit of nothing more. The important relations of botany to medicine have long been recognised, and it forms one of the regular branches of study in the medical curriculum, and anyone who takes the trouble to reason on the matter will at once admit that, were it introduced as a regular study into our British veterinary schools, a great desideratum would be supplied. Setting aside the important relations of botany to medicine, we can scarcely be excused for neglecting it for its general interest. No matter in what direction we cast our eyes, they encounter an infinite multitude of the most dissimilar germs of vegetation. Every latitude has its own flora, and on no two degrees of the earth's surface is the vegetation identical; and whether in the dense forest, the bare moor, or rocky sea beach, objects full of beauty and interest appear at every step.

How often is the veterinary surgeon called in to cases where the animal or animals are suffering from having partaken of some poisonous plant. Here, if he be a botanist, his knowledge will stand him in good stead. By examining the pasture where the animals were grazing, he will readily detect the cause of the mischief; in some cases it is in the field itself, oftener within reach over the fence.

Again, botany enables us to distinguish our many varieties of vegetable medicines when flourishing in the woods and fields, and in this case might become a direct saving, by enabling us to collect our own supplies, instead of trusting to the too often stale and adulterated samples obtained from the druggist.

We must now take up the consideration of Zoology, it being the next subject claiming our attention. The relation of the natural history of the animal kingdon to veterinary science furnishes matter enough of itself for a long paper. Earth, air, and water are all alike, filled with multitudes of living animals, each adapted for its own situation. These differ in size, from the minute animalcule, a million of which are no bigger than a grain of sand, to the colossal elephant and unwieldy rhinoceros; and not only do they differ in size, but in kind. Each climate has its own peculiar forms of animal existence. And when we tire contemplating the immense multitude of animal forms in external nature, there is yet another field to which we may turn, and though the known species are perhaps less numerously represented, they are even more mysterious in their habits and mode of life. I allude

to the various forms of parasites existing in our own bodies and those of nearly every species of animal, preying on the substance and food of the living structure surrounding them.

The sub-kingdom Vertebrata is not the only one important to the veterinary surgeon, though it contains all the animals we treat. Nearly all the remaining sub-kingdoms include animals with which we are daily brought in contact. Such as the various forms of external and internal parasites, which burrow in the skin or infest the stomach, intestines, or muscles of the higher animals. How interesting to study the nature and habits of these creatures—their general configuration, intimate structure, and modes of nutrition and reproduction all being alike wonderfully adapted for the circumstances in which they are placed.

Again, when we know that myriads of microscopic animals are constantly floating through the air, and that these may be dried into dust and so kept for months, and when brought under the influence of heat and moisture again start into life, how interesting to speculate on the influence these insignificant animals may possess in the propagation of disease, in rendering what are considered infectious truly contagious, &c. Of course this is mere speculation, but it contains no impossibility and much that is highly probable.

On zoology much more interesting matter might be written ; we could study the principal vertebrata from a morphological, physiological, and distributional aspect, but the subject is too extensive to be attempted here.

Geology, though a science that cannot be said to have any direct bearing on veterinary surgery, yet indirectly is of such vast importance as fully to justify us in noticing it here. It tells us of the changes undergone by the earth before it arrived at its present condition, traces it through all its metamorphoses, whether sudden and convulsive or slow and gradual, and demonstrates that to these very changes we owe that boundless variety of sea and land, mountain and plain, hill and dale, with their accompanying rocks, strata, and soils, so essential to the existence of the present order of things. Besides all this, it treats of the age, origin, and nature of rocks, fossils, volcanoes, rivers, seas, &c. To the various departments of natural philosophy, the veterinary surgeon owes much. Mechanics, electricity, magnetism, and meteorology, we have specially to thank for their useful contributions. From the last-named science we learn to trace the effects of heat and light on the earth, the ocean, and the atmosphere, and the laws of distribution and change of these wonderful agents in the production of climate, &c.

These, gentlemen, are the principal sciences with which we are more immediately brought in contact ; otbers of equal importance yet remain, such as classical studies, mathematics, logic, &c., but they are less direct in their application. Classical studies refine the taste, and along with rhetoric teach us easily and fluently to express our thoughts. Mathematics cool the heated imagination and teach us calmly to reason with the exactness of a machine. Logic

enables us to follow and analyse those silent processes by which almost unconsciously we apply our so-called common sense to the discussion of subjects of every day life.

It is interesting to observe how the various sciences hinge into without infringing on each other; how each, like the different parts of a machine, serves its own particular end in its own particular place, and though each has its special sphere and independent duty, all are required for the formation of one harmonious whole.

When the sciences thus depend on each other, to understand them properly it is necessary to possess a general knowledge of all; of course more than this is beyond the comprehension of a single mind. The possession of a certain amount of knowledge, in every properly regulated mind, always furnishes a continual stimulus to the desire for more, and knowledge which does not create this desire is not knowledge at all, but mere cram.

Much of the knowledge we gain may be useless to us in the business of life, but it confers high and compensating enjoyments, and leads to the development of those gifts of the Creator which distinguish men from the inferior animals.

The possession of knowledge, so far from leading to vanity or self-importance, tends rather to promote humility. At this we need not wonder, when we consider how little we know, not merely of all that is known or may be known, but of the really useful portion of the immense field of knowledge already worked out. It is true we can only go a certain length, but it is the duty of all of us to go as far as we can, and though getting a general knowledge of the sciences is individually the most useful, excelling in a special direction will produce far more general good, and doubtless be its own reward.

In all the sciences much yet remains to be discovered, and whether we look above us, beneath us, around us, or within us, we are alike encircled by unexplained mysteries, all testifying to the comparative littleness of our own understanding and the incomprehensible greatness of the Author of all.

Veterinary Jurisprudence.

ACTION RELATIVE TO HORSE WARRANTY.

At the County Court at Bedford on Wednesday, December 11, before Mr. J. Collyer, judge, and a Special Jury, an action for the recovery of £15 was brought by Mr. John Gurrie, a travelling draper, residing at Bedford, against Mr. John Baird, who is also a travelling draper, and lives at Fenny Stratford. Mr. Hooper, solicitor, Biggleswade, appeared for the plaintiff; and Mr. Stimson, of Bedford, for the defendant.

Plaintiff deposed as follows :—In consequence of a conversation which I had with Mr. Burgess, I wrote a letter to defendant on the 25th of October last, stating that I had got a horse and a chesnut mare for sale, the latter of which would suit him well, as she was good for the trade. The price of the mare would be £16. I received the following reply :

"FENNY STRATFORD, *October* 26, 1867.

"Mr. Gurrie,—Dear Sir,—In answer to yours of the 25th inst., I had not made up my mind whether I should buy another horse just now, but if I did buy one, I don't mean to give more than £10 for it, as one about that price would suit me. However, since yours is a good one, and you have been so kind as to give me the first offer, I will give you £15 for the chesnut mare.

"JOHN BAIRD."

Plaintiff went on to say that, having acceded to these terms, he received instructions to send the mare to Fenny Stratford by the 4.30 p.m. train on the 2nd November, and complied with these directions, forwarding also the following letter :

"BEDFORD, *November* 2, 1867.

"Mr. Blaird,—Sir,—I have sent off the mare this afternoon by the 4.35 p.m. train, hoping she will arrive at Fenny all right. Will you be good enough to bring my rug and surcingle with you to Bedford, as I shall be in want of them? Will you also get some oakum tar and put on the mare's fore feet, as she is sometimes troubled with thrush in them? Give her a warm bran mash every Saturday, and getsome alterative powders, and give her a tablespoonful amongst her corn once or twice a week, and a quarter and a half of corn three times a day. You must not give her any beans, as they are too heating for her. Get some nice red carrots and give them amongst her corn. All these instructions will cost you 20s. more, but you will not grudge that. Tell the blacksmith that shoes her to be careful of her feet and shoe her very slack.

"JOHN GURRIE."

Plaintiff, resuming—The mare was sent back, but I returned her to defendant, who again sent her back. I refused to take her, and I received a notice from Messrs. Stimson and Conquest to the effect that the mare was put to livery and would be sold. I was offered over £15 for her by Mr. Armstrong, of Luton, about a fortnight prior to her sale to defendant.

In cross-examination—*Plaintiff* stated that after the mare had been returned the second time, she was sold at Messrs. Stafford and Son's yard for £6. The defendant then offered Gurrie £5 14s., having deduced 6s., the expenses of the sale, from the amount realised, but plaintiff refused to accept the sum. The mare was well suited for travelling drapers.

The Judge—She was a good hand at stopping at people's doors?

Witness—Yes, your Honour.

The Judge—She understood instalments. (Great laughter.)

Mr. Adam McKay, travelling draper, deposed that the mare had

been originally sold by him to the plaintiff for £23, and had been driven ever since up to the time of the sale to defendant. She was quite suitable for the business, and had been driven from 100 to 120 miles a week. He bought her in at Stafford's sale for £6.

Mr. Armstrong, of Luton, deposed that he had offered plaintiff £18 for the mare previous to the sale to Baird, and was now ready to give £15 for her. He attached no importance to the fact that she was subject to occasional attacks of thrush.

For the defence, it was contended that the mare had been purchased on the understanding that she was to fit the new trap and harness bought some time before by defendant. On receiving her, the defendant found she was much too large, and also discovered that she was subject to thrush, together with being shaky, when walking, and having her fore-legs a little bent. These facts were deposed to by defendant and Mr. Burgess, but ultimately, after deliberation,

The Jury returned a verdict for plaintiff, his Honour having ruled that there had been no warranty whatever given at the time the contract was entered into.

COURT OF EXCHEQUER.

(*Before the* Lord Chief Baron *and a* Common Jury.)

Chattell *v.* Lounds.

CASE OF INJURY.

This was an action to recover the sum of £50, being the alleged value of a mare which had been killed in consequence of an accident resulting from the negligence and disobedient conduct of the defendant's servants.

Mr. Huddleston, Q.C., and Mr. H. Matthews appeared for the plaintiff; and Sergeant Parry and Mr. Dixon for the defendant.

The plaintiff is a veterinary surgeon, and the defendant keeps the White Hart, at Bromley. It appeared that a Mr. Bagg, who resides at Blackheath, had lent the mare in question to the plaintiff, and that he drove it over to Bromley. When he got there the mare was put up in the defendant's stables, and it was the assertion on behalf of the plaintiff that express directions were given to the stablemen that not only should the animal not be washed, but also that she should not be taken out of the stable to be cleaned. Nevertheless, the mare was taken out into the yard to be cleaned, and it was also said that she underwent the process of being washed down and scraped. The mare was fastened by a halter to a ring in the wall, and unfortunately almost in contact with her was a pump, from which a hook or knob protruded. While in the process of being cleaned, and in consequence possibly of the application of cold water, the mare reared, and coming down upon the hook and knob, injured her off fore-leg in such a manner, that under the directions of a veterinary surgeon she had to be at once shot. However, there

was a very considerable conflict of testimony as to whether the plaintiff had given any such directions as he had asserted relative to the non-removal of the animal from the stable, or to its being washed. At the same time, the servants of the defendant asserted that the mare had reared and plunged about without any explainable cause, and that her being washed had nothing whatever to do with the accident. In fact, it was contended that the whole affair was an accident, to which the mare had contributed by its own unruly conduct. Likewise, in mitigation of damages, it was said that the mare had been bought for £30, that she had been in Mr. Bagg's possession six months, and that it would be unworthy of him, or his friend the plaintiff, to make profit out of what evidently was a mere chance occurrence.

The Chief Baron, in summing up the case, commented on the lamentable conflict of testimony which it disclosed.

The Jury found for the plaintiff. Damages—£35.

COMMUNICATION FROM MR. H. PEARS, V.S., LANGHOLM, RELATIVE TO MR. FORDIE'S CASES OF EMBOLISM.

Gentlemen,—In the *Veterinarian* for December two cases of "Embolism" are recorded by William Fordie, M.R.C.V.S., of Langholm, formerly Lecturer on Anatomy and Physiology at the Glasgow Veterinary College, one of which I was somewhat surprised to find had occurred in the neighbourhood of Langholm. As I had no knowledge of this case until I saw it published in the *Veterinarian*, I made inquiries first as to Mr. Fordie, veterinary surgeon, of Langholm, and secondly as to whom this valuable mare, the subject of "embolism," belonged to. The name and address of the owner of the animal not having been given, I have had some difficulty to contend with, and indeed I have failed completely to find out the owner, but I have ascertained that Mr. Fordie had been sojourning at Langholm to recruit his health after the labours of the session. I understand, however, that Mr. Fordie seldom left his room, and was never requested to visit a patient.

Being a constant reader of the *Veterinarian* I have been induced to write you this note from a sense of duty, and to express a hope that none but authentic cases are ever recorded in the pages of your journal.

I am, &c.

To the Editors of the 'Veterinarian.'

[Immediately on receipt of this letter we wrote to Mr. Fordie, and received from him the following note. Up to the time, however, of going to press no other reply had reached us either from Mr. Fordie or the blacksmith. We may inform Mr. Pears that, to the best of our belief, none but authentic cases are ever recorded in

our Journal; and most certainly we should refuse to give insertion to any if we had the least suspicion of their genuineness.—Eds.]

NOTE FROM MR. FORDIE.

Buchanan's Temperance Hotel,
114, High Street, Edinburgh; *Jan. 17th*, 1868.

Sir,—As your letter has only been forwarded to me this morning, I regret that I cannot send you the desired information until I have communicated with the blacksmith who saw the mare previous to her death.

I have already written to this person, and hope, therefore, you will receive a satisfactory reply, when his letter comes to hand.

Trusting that you will excuse the delay that has unavoidably occurred in this correspondence,

I remain, yours truly,
William Fordie.

To Professor J. B. Simonds,
Royal Veterinary College.

TESTIMONIAL TO MR. J. ROBERTSON, M.R.C.V.S., Maderty, Perth.

We have been requested to record the presentation of a silver tea service and a splendid watch to Mr. Robertson, of Maderty, President of the Centre of Scotland Veterinary Medical Association, by his friends and professional supporters. Indeed, the tea service was rather a presentation to Mrs. than Mr. Robertson, a novelty in these proceedings which we highly approve of. Our want of space will not allow of our giving the details of the meeting at which the presentation took place.

EPIZOOTIC DISEASES.

Members of the Profession would confer a great favour upon us if they would at every convenient opportunity communicate with us, in reference to the spread of infectious and epizootic diseases among stock in their districts. Exact information upon these subjects is of great importance, and we must rely in a great degree upon the kindness of our friends, who are accustomed to respond so readily to our appeals, that we have little scruple in again asking their assistance.

ARMY APPOINTMENTS.

War Office (*Gazette*).

R. W. Murray, V.S. Royal Artillery, to be Veterinary Surgeon, 1st Class, *vice* W. Johnson, promoted to the Staff—India.

M. F. M. Case, V.S., to be Acting Veterinary Surgeon, *vice* J. Allen, resigned.

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Communications and Cases.

THE TRANSIT OF DISEASED ANIMALS.

How far it is practicable to restrict the movement of stock affected with contagious diseases without seriously deranging the system of traffic which has been in operation for years, is a question that is now being very carefully and anxiously discussed by breeders, graziers, and cattle salesmen. It is easy to devise a scheme which looks well upon paper, but which in practice will inevitably break down at the outset. If an Order of Council were passed to-morrow prohibiting the movement along public roads of animals suffering from mouth- and foot-disease, or pleuro-pneumonia, no objection could be urged against the abstract justice of the measure, but it would nevertheless be impossible to carry the Order into effect. From an attack of mouth- and foot-complaint no bovine animal is secure for many consecutive hours, certainly not for two days. The infection may be received on a journey to a fair or market, and almost at the moment of sale the disease may become developed, and in that event the purchaser will find himself in a dilemma, as the owner of stock which he is neither permitted to move nor allowed to keep in the place where they were bought.

Pleuro-pneumonia having a much longer period of incubation than mouth- and foot-complaint, is not likely to appear among stock during a journey, providing they have not been exposed to the infection previously to their leaving home; but it is quite possible that now and then animals from

an infected herd will, during the time they are travelling, give evidence of disease, and in that case the same difficulty in regard to the disposal of them will occur; they must not be moved along the road, even though it be intended to return them to the place from whence they set out, and there is nothing left but to kill and bury them on the spot where they are attacked. With the probability, to say nothing of the certainty of the occurrence of these accidents, it is evident that legislation must stop short of interference with the movement of animals which become diseased in transit. To prevent the exposure of them in fairs and markets is perfectly practicable and right; but to attempt to hinder their passage along the highway would be unreasonable, and in result abortive, because it is impossible to provide against the contingency of animals becoming infected, or giving signs of a previous infection on their way to or from a fair or market. Legislation to be effective and just, must deal with infectiously diseased stock in the locality where the infection exists. There is no hardship, certainly no injustice inflicted, by a prohibition against the removal of animals from premises or from a district in which a contagious disease is known to prevail. And if, acting on this principle, diseased or infected animals are restricted to a defined locality so long as the necessity exists, there can be no difficulty about movement along public roads, or exposure in fairs and markets. To effect this object it is only necessary to modify the system which, during the existence of cattle plague, was found to act so beneficially in preventing the extension of other contagious maladies, and which, in fact, almost effected their extermination. We refer to the removal of stock by licence. Objections will, of course, be raised by certain traders, but we are convinced that the general feeling of the agricultural community is in favour of restriction upon the movement of diseased animals, and the very trifling inconvenience which is entailed is not to be compared with the amount of good which will be effected.

We are at a loss to understand what ground of complaint the honest dealer in stock can find in the circumstance of being obliged to certify that the animals which he desires to remove from his premises have been in his possession for more than twenty-eight days, and that no infectious malady has prevailed among his stock, or within a certain defined area for that period. If these necessary conditions cannot be affirmed, the animals are unsafe to be travelled about the country. Doubtless dishonest dealers would strongly and persistently object to the continuance of a

system which utterly destroys their occupation, and probably many energetic business men, may prefer to turn their money as often as possible, and therefore may not care to keep stock any longer than may be absolutely necessary; there are, beside, well-intentioned persons, who object to the least interference with what they term their freedom of action, which seems to mean the right to attend exclusively to their own interests, with a total disregard of those of their neighbour. The answer to all these objections is easily given. Private convenience and prejudice must be sacrificed to the public good. It is absolutely necessary to take precautions in the transit of dangerous commodities; and we are pretty well acquainted with the fact, that a herd of oxen constitutes a dangerous commodity, as the animals may, at the time they appear to be in perfect health, contain within their systems the germs of a deadly disease which only awaits the occurrence of favorable conditions to burst out with a destructive force, which if not equal to, in immediately apparent violence, is more lastingly destructive than an explosion of nitro-glycerine. The necessity for some modification of the present system of cattle traffic is now very generally admitted, and it cannot be doubted that the legislature will be induced to pay attention to the subject. Very little machinery is required beyond what now exists. Inspectors are already appointed in the districts of every local authority, and it might be made part of their duty to report upon the health of the stock within each district: thus it would be known, by reference to a list, what farms should be closed, and what remain free. The owner's declaration would be sufficient to entitle him to a licence, or a general licence might be granted, to continue in force until the inspector reported the presence of an infectious disease among the stock, when it should, "ipso facto," be revoked until the disease ceased, and the premises had been properly disinfected. Some such plan as this would necessitate very little trouble, and would only inflict injury upon those whose proceedings would be justly met by a more condign punishment than the mere deprivation of the power to do further mischief.

OBSERVATIONS ON "SOUNDNESS."

By R. H. Dyer, M.R.C.V.S.

(*Continued from* p. 85.)

It is more than probable several other members of the profession have had an opportunity of examining the animal in dispute, and the opinions are pretty well divided,—six of one and half dozen of the other. It must not be forgotten that the case at this moment assumes gigantic shapes. We have a hundred pound horse, two well-known and respectable gentlemen as plaintiff and defendant, two highly respectable lawyers, a dozen or more veterinary practitioners (some qualified, others unqualified), half a dozen farriers, as many grooms and helpers, besides friends of "B.," who have known the horse for years; and, lastly, the last purchaser of the animal. The case is opened in the usual way, and the plaintiff, through his counsel, is made to say much that he would rather had been suppressed. Witnesses are called to prove the unsoundness of the horse in dispute.

The first declares, in the most solemn manner, that the horse made a noise when galloped, but it didn't seem to interfere with him; and he considers him unsound. On cross-examination this witness is made to say—very much against his will—that he seldom is called upon to examine horses as to soundness, and that the noise which he heard, and considered an unsoundness, may or may not interfere with his respiratory organs; or, in other words, may do no harm during exertion. So much for this evidence.

The second witness for the plaintiff makes a similar statement to the first, and further assures the jury that a "whistler" is an unsound animal. The evidence of the others, on behalf of the plaintiff, varies but little in detail, although it is more than probable much has been suppressed by some of the witnesses, because, if they had said what they *could* have said, it would have damaged their client's case. In the examination of evidence put forward for the plaintiff, it would seem that the case is a strong one. Counsel on the other side takes it in hand, and draws some pictures which had not appeared before. He informs the court and the jury that noises are sometimes made by horses which do not interfere with their functions in any way, nor do they amount to unsoundness. To prove this, he shall produce undeniable evidence.

Most of the defendant's witnesses are (so far as the veterinary practitioners are concerned) men of standing, respectability, and experience in the examination of horses as to soundness. The first informs his hearers that he has carefully examined the horse (before the court), and is of opinion he is *sound*. Counsel for plaintiff cross-examines this witness, and he does not hesitate to declare that the horse *did* make a noise when under examination, but that was easily accounted for from the fact of his being a large and powerful one, with a very impetuous temper, very eager to gallop away from everything, and consequently under most circumstances a *double puller:* that is to say, unless there was a large field, or park, the horse could not be allowed to have the free and natural use, or play, of his head and neck, so that the functions of the different parts were materially interfered with, but only in a temporary way; and this, in his opinion, was the cause of the noise which he heard during the examination. To prove his case, he informed the court that almost at the outset the animal made the noise, and so continued until he was allowed to have his head, and go at top speed, when it immediately ceased, and, the animal once settled down, no noise was heard; this being the reverse to what we observe in most cases of whistling, &c. At the commencement of a canter, or gallop, no noise is perceptible, but, as it progresses, the noise is heard, and increases in degree as the pace and exertion is continued. Most of the witnesses having offered similar evidence, and this, coupled with that of the seller "B." and his employées, together with the statement made by the new purchaser, that a sounder horse never was crossed, caused the jury to agree to a verdict for the defendant.

So ended the case.

Now it may be very properly asked how this evidence can be reconciled? Is it really the fact that so many men swore the contrary to the others? It cannot be denied that this is very commonly met with in courts of law, but how is it to be explained? The defective manner in which the examinations as to soundness is conducted, is one source of regret. The law of soundness is another. I should not like to assert that the "law of warranty" is in itself the cause of the evil so often complained of. I have no doubt it stands in need of revision.

The chief ingredient required to cause examiners to agree in their opinions is a more definite law as to soundness. Most people agree as to facts, but they differ in their ideas of what those facts are capable of being converted into.

Suppose, for argument's sake, an animal is found to have a slight bony excrescence upon the metacarpal bone, say within a line's length of the suspensory ligament, and it really extends no farther, is the animal to be considered sound or unsound? This is the main question to be decided.

Again, if a pimple be seen upon the back, which for a time will prevent a saddle being placed there, is that animal an unsound one? We are told by high authority it is an unsoundness. Numerous cases may be cited in this manner, with a view of bringing out the opinions of others. So long as the law exists in its present state, we shall ever be at issue with our brethren. This brings me back to the place from which I started. I think I have asserted more than once that it is not always convenient to stick to the letter of the law. Purchasers of horses have the law very much in their own hands. Seeing the uncertainty of the law as to warranty, it is much to be regretted the veterinary surgeon is not more sought after. In offering these remarks I do not forget what I have often been told, viz., that, as a general rule, it is as well to take one's own opinion as that of a "Vet.," because so few are found to give satisfaction. This objection would be got over if the "Vet." were more generally employed. If 'twere the rule, and not the exception, we should be well up in the business, and be in a better position to advance opinions upon questions as they arise.

Instead of taking a case into court, a better way to deal with it would be for two veterinary surgeons on either side to act as arbitrators, and their decision be final, or a fifth to act as referee. This would, I believe, be advantageous to all parties—to the seller, to the purchaser, and to the veterinary profession generally. I am satisfied it would tend to strengthen the position of the members of the profession.

In reference to the supposed case cited above, where so many witnesses were examined in evidence, many, very many of those persons would have been dispensed with. One precaution, however, appears necessary, even in such steps as I have suggested. It would be unwise to bring together men of high and men of low standing, else the man who considered himself the inferior would in all probability yield to his superior without opposition. I do not know if such a plan is tenable. I merely throw out the hint as one of the many ways to prevent litigation. One thing is certain, the veterinary profession is seldom promoted by these legal exhibitions.

(*To be continued.*)

OBSERVATIONS ON CAUSES OF ROARING.

By James Anderson, Veterinary Surgeon, Glasgow.

Roaring is a subject which not only demands the greatest possible attention of the veterinary surgeon, but also that of every class of horse proprietors. It is of importance to the former, from being so intricate in its nature, and obscure in its causes, which are so numerous. To him it is of great interest, from being so often the cause of heavy losses.

What induces me to write on this subject is, that I have had the opportunity of seeing a great many cases of "roaring," both in the hunting field and dealer's yard, and I have now become pretty familiar with the sound, which is so easily recognised by almost everybody connected with horses.

I may say that I never had any difficulty in diagnosing a case of "roaring," and of confidently giving my opinion of such when desired; but when the question comes, What is cause of the roaring? then the difficulty arises of giving a definite answer. I therefore have taken a little interest in the subject, and read the opinions of different authors, and, amongst others, those of some of our continental brethren, and I find the causes to be many. They are both innumerable and obscure, and, having perplexed me not a little, they have stimulated me to use pen and ink in order, not only to express my own ideas, but to obtain more information on the subject.

With regard to the disappointments, &c., which "roarers" occasion to gentlemen, I cannot resist saying a few words, as I know of numerous instances of this kind.

If a gentleman is passionately fond of hunting, he very naturally devotes a great deal of attention and care to his favorite animal. He likes to be well up, and comfortably carried in a run. Money is no object to him so long as he gets a horse to his mind, and sound. It may be that after a long search he obtains one which pleases him; but after hunting him for three months he begins to show signs of this disagreeable malady. The owner then despairingly sacrifices his unfortunate animal by selling him for a mere trifle compared with what he gave for him, and to his intense disappointment he is also deprived of the sport for the rest of the season.

With the breeder the case is still worse. For instance, a breeder rearing a number of fine colts, for which he is in great hopes of receiving high prices on their attaining the age of four or five years; and after nursing them for three years, most of them suddenly turn "roarers," from no known or visible cause. He has to bear the heavy loss and disappointment by selling them to the cab proprietors for a few pounds.

Mr. Barrens, of Andover, an extensive dealer in valuable horses, mentions that his annual loss from horses turning "roarers" amounts to £1000. What a very great saving it would be to Mr. Barrens, or any other gentleman, were he able, from knowledge of the causes of those affections, to remove them.

I herewith annex a table of the most of the causes of "roaring," which I have extracted from different authors, with remarks to some of the most particular ones.

Causes of Roaring.

1. Acute diseases of the respiratory tracts.

Examples.—Coryza, simple angina, gangrenous, bronchitis, affections of pituitary membrane, of guttural pouches, of parotids, of cellular tissue, of the pharyngeal region, of lymphatic ganglion, strangles.

2. Fleshy growths.

3. Swelling of the septumnasi from caries.

4. Sinking of nostrils.

5. Anasarca, causing tumefaction of alæ of nostrils.

6. Thrombus.

7. Phlebitis.

8. From Œsophagotomy.

9. From foreign bodies lodged in back part of mouth.

10. Abscess under mucus membrane of nose.

11. Abscess under tracheal mucous membrane.

12. Passing, or temporary compression of larynx, or pneumogastric nerves.

13. Serous infiltration of cellular tissue surrounding these nerves.

14. From chronic inflammation of mucous membrane of respiratory tracts, producing thickening, deposits of morbid products, organic alterations by ulceration.

15. Acute diseases of superior tracts of aerial tubes.

16. Plenitude of guttural pouches.

17. Glandered ulceration of mucous membrane of larynx and trachea.

18. Polypus, or fibrous tumour in nasal cavities, in back part of mouth, in trachea, in the bronchia.

19. Tumours obliterating pulmonary artery, and causing hæmatosis, and preventing respiration.

20. Contusions of pituitary membrane of nasal septum; ossification of them; bony tumours on internal surface; diseases of teeth, accompanied by swelling of their roots and alveolar walls.

21. Tooth falling into maxillary sinus, and then fixing itself into thickness of nasal septum.

22. Old lesion of velum palati, pharynx, and guttural pouches.

23. Prolapsus of velum palati.

24. Formation of a membrane analogous to pituitary, over the opening of the guttural pouches.

25. Tumours, or old abscesses under parotid, or neighbourhood of walls of pharynx.

26. Ossification of cartilages of larynx.
27. Ossified arytenoid cartilage closing the glottis.
28. Deformities of larynx from paralysis of laryngeal nerve by producing diminution in calibre, always causing atrophy of dilatator muscles.
29. Special lesions of mucous membrane of larynx.
30. Formation, either from hereditary disposition, or inflammation, of an erectile spongy tissue under mucous membrane, covering superior borders of arytenoid cartilage.
31. Œdema of glottis, or an infiltration of sub-mucous cellular tissue of larynx.
32. Lesions of trachea, either a morbid modification with alteration of tissue, or simple change in form, such as calcareous deposit in tracheal cartilages from tracheotomy, causing contraction of trachea; from wounds; external violences; ulceration of mucous membrane.
33. Formation of a false canal.
34. Considerable engorgement of ganglion at entrance of chest.
35. Compression of recurrent nerves, and also lesion of them, or of vagus nerve.
36. Cutting artificially the pneumogastrics.
37. Artificial compression in fibres of eighth pair, as the inferior laryngeal.
38. Infiltration of cellular tissue.
39. Acute angina.
40. Abscesses from angina in maxillary space, and also in parotids.
41. Inflammation of ganglia.
42. Paralysis of alæ of nose.
43. Alimentation of plants (leguminosa), such as Lathyrus, Cicera.
44. Peculiarities in the formation of the head.
45. Hereditary disposition.
46. Particular attitude of the head during work, by compressing the larynx and preventing its movements.
47. Weakness of velum pendulum palati of glossis, of epiglottis; defective conformities of chest.

Remarks.—With regard to the cause, No. 1 on this table, it takes in all the diseases of the respiratory tracts of a comparative acute character.

My small amount of practical knowledge on this subject has led me to look upon this cause of "roaring" as being of very great importance, from the diseases enumerated under the title of "acute diseases of the air-passages" being so numerous and common.

Although every case does not fortunately terminate in so undesired a manner, still a great number of them leave bad results, which although apparently slight, yet cause that disagreeable noise which so much diminishes the value of the animal.

To illustrate how slight may be the cause of "roaring," from No. 1 collection I will take bronchitis as an example.

In acute bronchitis the mucous membrane of the windpipe is inflamed, and as an essential character of the inflammation you have a swelling. Should this inflammation terminate by resolution, the swelling of course will soon disappear, but there is always a great tendency for exudations from the capillaries to become organized, thereby causing a permanent thickening, and thus obstructing more or less the

calibre of the tube. This obstruction causes a rapid inspiration of air, and in this manner produces the familiar sound. According to the extent of obstruction so is the intensity of the sound.

No. 2.—Mr. Godine, jun., relates a case of roaring which was caused by a large cancerous tumour situated near the division of the bronchia, just at the entrance of the thorax. This tumour produced pressure on both the heart and lungs. The former it directed to the right side, and the latter back. The bronchia near the origin of the windpipe had lost nearly two thirds of its normal diameter.

I remember seeing a case very similar to this described by Mr. Godine, jun. The tumour in this instance was situated between the two first ribs, one of which was broken. The tumour pressed against the bronchia.

No. 4.—At a late meeting of the "West of Scotland Veterinary Medical Association," our worthy friend Mr. Bryce, veterinary surgeon, Stirling, mentioned a number of cases of roaring produced from severe pressure on the nervous filaments which are arranged round the nasal orifice, and which supply with stimuli the elevator and dilatator muscles of the nose. The effects produced from the pressure were paralysis and falling in of the wings of the nostrils. The animals were all young that were so affected. The agents which caused the pressure were halters.

In order to convince the owners of the cause of the noise, Mr. Bryce, by mechanical means, distended the wings of the nostrils to as near as possible their natural diameter, and so as to admit the normal column of air, and immediately after doing so the roaring ceased until they were again allowed to collapse.

Mr. Bryce's treatment consisted in appying mild liquid blisters, which always had the desired effect.

No. 18.—My father tells me of a case which he had nearly thirty years ago, where the breathing was so difficult as to be accompanied by asphyxia. In treating this case he performed tracheotomy. Two years afterwards, when the animal had a second attack, it died.

On a careful *post-mortem* examination being made, my father, to his surprise, found an encysted fibrous tumour loosely attached to the base of the tongue. On the animal inspiring air the tumour must have been directed towards the opening of the glottis, and so obstructed the passage of air. My father regretted very much not having examined the mouth at the time of the first attack, as he says the tumour could have been easily extracted.

No. 27.—Mr. Bowley, jun., mentions a case where the superior parts of the walls of the two arytenoid cartilages had become so much thickened from disease that they formed a false articulation, and there only remained a small opening at the inferior part of these cartilages.

No. 32.—I had a case of choking from severe laryngitis about two years ago, for which I performed tracheotomy with success. About twelve months after ossific deposits were thrown out on the internal surface of the wall of the windpipe, at the place where the tube had been inserted. The deposit ultimately became so great that the formation of a bony oval tumour took place, which almost wholly obstructed the aëreal channel, the only relic of an opening remaining being a narrow canal running through the centre of the tumour, admitting no more than the insertion of a lead pencil of ordinary thickness.

The consequence of these morbid phenomena was, as one might suppose, a second attack, which proved fatal. I obtained the larynx and windpipe, which I consider to be a valuable specimen of morbid obstruction of the air-passages.

No. 33.—Mr. Lafosse mentions the following interesting case. An old horse was treated several times for an affection of the respiratory passages, accompanied by dyspnœa. The symptoms were at first intermittent, but by and by they became persistent; and although rational treatment was put in practice by Mr. Lafosse, the horse, after a violent attack of dyspnœa, died asphyxiated.

Post-mortem examination revealed the following lesions:—Bronchial ganglion enlarged, hard and brown, and adhering between them and with the lungs. They contained several purulent points. The pneumogastrics were confounded in the ganglionic mass which compressed them. The trachea was flattened in the thoracic cavity. The extremities of the depressed rings were stretched and re-united by fibro-cellular tissue. The mucous membrane of the trachea was ulcerated in several places, the principal ulceration being very extensive, and situated about four or five inches from the bronchial bifurcation. It perforated the mucous membrane and the superimposed layer, and terminated in a conical *cul-de-sac*. At its superior part this canal had several openings, which caused it to communicate with the trachea.

Mr. Lafosse says that these lesions explain pneumatically the existence of whistling and its intermittent character. The air engulfed itself during expiration in the false canal by its posterior opening, and if its anterior openings were closed by bronchial mucosities the air, having no escape, it bulged

out the canal, and thereby diminished the caliber of the trachea.

No. 43.—Mr. Delafond mentions three very interesting cases of "roaring," caused by feeding on gesse chichi, which is a species of vetch (*Lycerus cicerus*), on straw, and grain. He says that, under this alimentation, the horses appeared in good condition, their coats being smooth and shining. Within the space of five days, from the 15th to the 20th of June, the three animals became roarers, and so bad as to threaten asphyxia. During rest he says that the respiratory tracts denoted nothing wrong, but on trotting them for ten minutes the roaring became very intense.

No. 45.—M. Lephacart, a great horse proprietor of Livonic, possessed a fine English stallion, which, when near the age of ten years, became a roarer without any appreciable cause. Since then nearly all his produce have been similarly affected, besides eight mares which he kept for breeding purposes. It is a very curious fact that the produce, on attaining ten years old, became roarers the same as the sire.

I believe another very common cause of "roaring" is by compressing the larynx—a habit which, I am sorry to say, is practised very much. I know of two instances of severe inflammation of the throat, which I can positively say were caused by compressing the part with the hand. In both cases it was done while the animals were being exposed for public sale.

It is disgusting to witness, at horse fairs and in sale yards, how frequently horses are thus cruelly treated by having their tender larynxes compressed by the rough hands of "would-be judges," especially when they do not know what they do it for.

In conclusion, I look upon "roaring" as the great generator of disputes in professional examinations for soundness: and I do not at all wonder at it, seeing there are so many obscure and deceptive causes. A great many of the causes seem to be produced through lesion of the nerves supplying the larynx —not only proximate lesions, but also remote. If, then, remote lesions of these nerves tend in any way to produce it, I can easily see how it might be caused from indigestion, by a temporary morbid influence produced on the pneumogastrics.

I believe, then, that a temporary "roarer" may be produced by indigestion; and I think it very probable that a horse may be sound to-day and a roarer to-morrow.

REPLY TO A LETTER BY MR. T. GREAVES, M.R.C.V.S., (which appeared in our Number for January) ON THE PROPOSED SCOTCH CHARTER.

To Peter Maclagan, Esq., of Pumpherston, M.P.

Sir,—We, the undersigned, beg to be allowed to convey through you, a Scotch Member of Parliament, to His Grace the President of the Board of Trade, our respectful protest against the statements and inferences contained in the letter addressed by Mr. Greaves, veterinary surgeon, Manchester, to Mr. Newdegate, M.P., and published in the *Veterinarian*, January, 1868, and which, the same journal informs us, has been forwarded to His Grace the Duke of Richmond by Mr. Newdegate, M.P.

1st. Looking back into the history of the Charter controversy, we cannot but regard the use of the term "proposed veterinary school" as unfortunate, more especially in a letter professing to be "carefully and clearly" expressed for the information of His Grace. We are, however, willing to regard the word "School" as accidentally used for "College." The latter is certainly the only term which expresses the kind of institution for which we are now endeavouring to obtain a Charter.

2nd. As regards the 104 veterinary surgeons in London who, Mr. Greaves states, signed a petition to the House of Commons in May, 1867, against a Veterinary Charter being granted to Scotland, we respectfully appeal against this English metropolitan demonstration affording any valid test of the justice of our Scottish claim. The history of the efforts by which the capital of Scotland has been ultimately enriched through the concession of independent national establishments has demonstrated, on all occasions, the strength of the conservative policy of the greatest city of our empire.

3rd. Had Scotland possessed, as England does, many well-organized and effective veterinary associations, we affirm that the numerous memorials, stated to have been sent in from the veterinary societies of England against our Charter, would have been met from Scottish societies by as many memorials in its favour, *so soon as the terms of the proposed Charter were suitably arranged.* There are, we believe, only two veterinary societies existing in Scotland at the present

time, and to the opinion of these societies on the present matter we shall afterwards refer.

We have no means of knowing in what way these memorials were obtained, excepting in the one instance alluded to by Mr. Greaves. The memorial against the proposed Veterinary Charter for Scotland, which was sent from the Yorkshire Veterinary Medical Association (which is the society referred to), was unconstitutionally obtained, no notice having been given before the meeting in the billets of what was to be proposed respecting the Scottish Charter at the meeting.

4th. We beg to state that it is with surprise and regret we find statements, such as Mr. Greaves embodies in section 3 of his letter, laid before His Grace the President of the Board of Trade, as affording reliable information on the point at issue. Mr. Bryce, member of the Royal College of Veterinary Surgeons, Stirling (one of the subscribers of this letter), was President of the West of Scotland Veterinary Medical Association when it waited upon the Lord Provost and other members of the Town Council of Edinburgh, on the 30th of October, 1867, at the Edinburgh Veterinary College. And there are others, also members of the West of Scotland Veterinary Association, who subscribe this letter, who were present at that interview.

We regret that we are compelled to deny the accuracy of the statement of Mr. Greaves, in his letter to Mr. Newdegate, representing the opinion of that meeting as adverse to *a Scotch Charter*. We declare that it was adverse only to *the* Charter, such as the draft then proposed intended to create. And we endorse our denial of Mr. Greaves' inferences from what he says was told him, by the fact that, at the first meeting of the West of Scotland Veterinary Medical Association, to which the general heads of the proposed Charter were submitted, *every member, excepting one,* most cordially subscribed the memorial in favour of it.

We have read the concluding lines of section 4th of Mr. Greaves' letter, and we appeal to the signatures on our present memorial as a sufficient contradiction of Mr. Greaves' illogical and unfair inference, that because the general feeling, as described by him, was unfavorable to the Charter as formerly proposed, therefore it was equally unfavorable to a veterinary Charter for Scotland in which the veterinary professors *might be fairly represented.*

5th. We beg to call your attention to what, since the numerical statement has an object in view, we may term the arithmetic sophistry of parapraph 4 of Mr. Greaves' letter.

Five hundred memorials (less 100 returned through the dead-letter office) were issued by Mr. Greaves. Total, say 400, received by the profession *educated at the Edinburgh College.* Of that number, 150 replied, and 250 returned no answer. On the authority of Mr. Greaves' letter, these are facts, to which add that 135 of the 150 respondents signed, and some of them also wrote against the Scottish Charter, whilst only 15 signed in favour of it. That Mr. Greaves considers the *silence* of these 250 Edinburgh graduates as the *consent* with him of at least the majority of that number is implied in his letter, and has been publicly stated by him in Manchester.

We take leave, and, as we consider fairly, to account in a different way for 238 of the 250 non-respondents to the English memorial, and shall now give the particulars of the results of the issue of a memorial in favour of the Scottish Charter among the alumni of the Scottish Colleges, for the most part also residing in Scotland at the present time. Mr. Robinson, of Greenock, chairman of the Veterinary Committee for promoting the Charter for Scotland, issued, during the month of January, 1868, about 300 memorials to graduates of the Edinburgh Colleges. Of these, 30 were returned by post, "not found," leaving 270 in circulation. Of that number 10 refused to sign in favour of the new Charter, whilst 238 signed in favour of it, and 22 have returned no answer at all. However, at the date of writing, answers are still dropping in. A notable fact remains to be stated, viz., that of the 10 who refused to sign our memorial, some sent this explanation along with their refusal, that they had been already induced to sign *against the Charter* (as formerly proposed); but, had they known that a veterinary Charter, on the terms now agreed upon, would have been proposed for Scotland, they never would have subscribed the memorial sent to them by Mr. Greaves.

We suspect that probability at least attaches to that explanation, which accounts for the 250 non-respondents of Mr. Greaves (claimed by him as his negative supporters), *being really the* 238 *positive supporters of the new Charter!* And considering that 22 have not yet replied to our memorial, possibly with a short delay we might make the numbers entirely coincide.

As respects the concluding paragraphs of Mr. Greaves' letter, we take leave to thank him, in the name of 238 members of the profession in Scotland, for the interest he expresses in the welfare of the Scottish veterinary profession. A profession united for every good and noble purpose we

desire to be. But there are means of uniting members of one profession other and more secure than the official seal of one College to the diplomas of our members. Our profession in Scotland not only does not derive any benefits from the present distant-ruling Board, but it has long languished under the indifference of that body to its requirements, and felt the incapacity of the present Royal College to infuse the spirit of life and active union among our members. It is alleged by some of the opponents of our Charter that we are poor—that we cannot support a separate Royal College. Very likely we are poor; but, we ask, has poverty ever proved an insurmountable obstacle in the way of Scottish enterprise? We have looked hopelessly to the present Royal College for an improved code of education, and surely if, as is alleged, we have but scanty means at our command, why not allow us to keep our small available revenue to ourselves, to be expended by a liberally constituted Board of efficient curators in attempting the very hopeful experiment of elevating the veterinary profession, by introducing an improved code of professional education in our schools. We pray His Grace, the President of the Board of Trade, that the incubus of a radically insufficient standard of veterinary education may be removed. The case is hopeless with a College Council constituted as the Council of the present Royal College is. Experience has taught us the fact, and it is our earnest desire, and we pray you to use your influence in every way in your power to dispel the unreal and specious arguments employed against our proposed Charter, founded upon the unjust assumption that, because we seek a new Chartered College, we therefore desire professional disunion; and because we petition for educational enfranchisement, and the honour and advantage of issuing our own veterinary diplomas (as a reasonable consequence), therefore we desire to cripple the present Royal College, or to lessen its national dignity.

How far Mr. Greaves may be "in force" enough to be able "to induce Government, &c.," we are not in a position to judge. But we take leave to hope that if the veterinary corophœus of the south shall ever influence the minds of men in power, the history of our defeat may connect our discomfiture with some more sound and logical reasoning adopted on the part of Mr. Greaves than anything we have yet seen from his pen on the Charter question. We beg to conclude by respectfully assuring you, on the word of men who have the good of the veterinary profession sincerely at heart, who have had ample means of forming an opinion, and who have no selfish ends to secure, that we know of no measure so

likely to benefit the profession as the establishment of a separate Chartered College in Scotland, pledged to carry out those necessary reforms which long years of practical acquaintance with the inefficiency of the present code of veterinary education has failed to instigate the Royal College of Veterinary Surgeons even to attempt.

We have the honour to be,

Sir,

Your most obedient servants,

ALEXANDER ROBINSON, M.R.C.V.S. and V.S., President of Veterinary Committee for Promoting the Scottish Veterinary Charter.

JOHN BRYCE, M.R.C.V.S. and V.S., Ex-President of West of Scotland Veterinary Medical Association.

ALEXANDER POTTIE, M.R.C.V.S. and V.S., Secretary of West of Scotland Veterinary Medical Association.

J. DOW, V.S., Vice-President of the Centre of Scotland Veterinary Medical Association.

G. STEWART, V.S., Secretary of the Scottish Central Veterinary Medical Association.

W. WILLIAMS, M.R.C.V.S. and V.S., Principal of the Edinburgh Veterinary College.

ALLEN DALZELL, M.R.C.V.S. and V.S., M.D., Secretary of the Veterinary Committee for Promoting the Scottish Veterinary Charter.

MR. A. OWLES IN FURTHER REPLY TO MR. GARRATT.

YORK, *February*, 1868.

GENTLEMEN,—Had not Mr. Garratt at first, in publishing his views respecting the system best calculated to preserve the foot of the horse, resorted to a pointed and gratuitous condemnation of the army system, I should not have troubled you with any remarks on the subject, but as Mr. Garratt thought proper to distinguish us by his disapprobation, I feel that I have some claim on your further forbearance, while I, for the last time, revert to Mr. Garratt's endeavours to support his adverse opinion. I am sorry to observe a tone indicative of annoyance in his letter, but I do not think that

this is any reason why I should either accept assertions without proof or remain silent. I will confine myself principally to one point, viz., expansion, as I think it is Mr. Garratt's belief in it which places us in the unfortunate position of opponents—noncombatants, I trust.

Admitting the attachment of the coffin-bone to the bars, Mr. Garratt asks, "What prevents the coffin-bone participating in the downward action?" But he omitted to reconcile or to explain away the antagonistic force referred to in my previous letter, resulting from the wing of the coffin-bone being attached to the wall as well as to the bars. I answer, then, that the attachment of the wing of the coffin-bone to the posterior part of the wall, and round the heels and along the bars, prevents the bone descending independent of the wall; and also prevents the latter expanding at its inferior surface. My reasons I gave in my former letter, which Mr. Garratt has not attempted to disprove by argument; whereas, proof of expansion, did it really take place during action, ought to be very easy to anyone possessing Mr. Garratt's "observation and practice," untrammelled by "routine and red tape."

Again, consider other effects of expansion from Mr. Garratt's point of view. The lower part of the space between the bars and the wall at the heels being filled by the sole, it follows that if the bars descend and the wall expands at the same time, the space between must be widened, therefore this part of the sole, which is flat, must either be elastic or have elastic connexions, or else be separated from the wall during its expansion. I leave Mr. Garratt to explain. Mr. Garratt inquires, "Is there not an interstitial substance of an elastic nature between the horny laminæ and crust?" and then answers the question himself in the affirmative—"evidently for the purpose of acting as a spring and preventing concussion." I imagine from this it is to this supposed property that Mr. Garratt ascribes the expansion of the wall. Did any such elastic connection exist between the horny laminæ and the crust, it would *allow* the latter to expand, but it would not directly contribute to such a result. I think no such elastic substance has been proved to exist between the horny laminæ and crust, and I think such an elastic connection of the coffin-bone to the wall would be productive of irreparable injury by pinching the delicate tissues between that bone and the hard sole from the descent of the bone, when weight came upon it. I have not stated that nature *never* allows the sole to grow too strong; the portion of a sentence extracted from my first letter by me did

not contain the following qualifying clause, "with rare exceptions, nature, &c.," it not being necessary to prove the inaccuracy of Mr. Garratt's quotation when he substituted the word *feet* for *sole*.

Apologising for again intruding upon your valuable space, I remain,

Gentlemen, yours faithfully.

To the Editors of the 'Veterinarian.'

MR. ROBERTSON IN FURTHER REPLY TO M.R.C.V.S.

KELSO, *February 7th*, 1868.

GENTLEMEN,—I am certainly so far gratified to find that M.R.C.V.S., in his letter to the *Veterinarian* of December last, had ideas as far removed from being gratuitously calumnious in his statements as are his present expectations of being made Prime Minister of Great Britain.

But I should have been more pleased, seeing he has furnished me with no more proof of the truth of his accusations than his own personal experience, had his avowal of the unwarrantable and uncharitable nature of his attack been more open and unequivocal.

I can assure him I am not alone in viewing the remarks occurring in the December communication as an insult to that section of the profession of which I form a unit. It is from his opportunities of residence and practice on both sides of the Tweed, he tells us, that the data and authority upon which he grounds his assertions, are derived. I am afraid his residence and practice in Scotland at least is, or must have been, exceptional, where, according to his own declaration, neither his amiability nor professional qualifications have obtained for him even a modicum of public respect.

"My remarks were not intended for individuals," says M.R.C.V.S. in his letter of this month. I am well aware they do not read as if they were, and this was the principal reason of my calling his attention to them. No, this seems too paltry a charge, so the whole body of practitioners in Scotland are held up for universal exhibition as those who are regarded by the public, amongst whom they exercise their profession, as dissolute and unworthy of notice. And yet, notwithstanding this, my friend does not consider he

has said anything offensive to veterinary surgeons in Scotland!

My friend need not be afraid of my occupying your valuable pages with a useless controversy regarding what is, and what is not, calumny. I assure him I have neither ability nor taste for calling anyone ill names.

I remain,
Gentlemen,
Your obedient servant.

To the Editors of the 'Veterinarian.'

[We hope that this will be allowed to close the controversy.—Eds.]

REPLY FROM MR. W. FORDIE.

3, St. James Street, Edinburgh;
Feb. 14*th*, 1868.

Gentlemen,—Your request would have been earlier acceded to, had I not deemed it better for certain reasons to wait until the *Veterinarian* had disclosed the name of the party who has made himself so ridiculously conspicuous by questioning the authenticity of my communication.

I can assure Mr. Pears, however, that my experience of the schemes of men has been too extensive, and my knowledge of the world is somewhat too ample, not to perceive the object of his wishing to become acquainted with all the circumstances of the case, and to admire the very courteous and gentlemanly manner in which he has accomplished his design.

It is, therefore, with the greatest reluctance that I relate the following details; and, in fact, if it were not for the purpose of showing you and other persons of importance that there is in this connection "neither hinge nor loop to hang a doubt upon," I would positively decline to hold any parley with your correspondent, for the very same reason that, once upon a time, made Falstaff flatly refuse to walk through Coventry.

The mare, then, belonged to Mr. James Johnston, of Newton-Mount; the place wherein she was lying when I saw her was a shed or outhouse situated close to the hamlet of Chapel Knowe, and the party who requested me to examine her is so well known in that locality that Mr. Pears will have no difficulty in understanding whom I refer to, and doubtless he will be quite delighted at the discovery he has made in this particular instance of professional opposition.

If it were not that "the dignity of truth is lost with much protesting," I could mention many other trifling matters concerning the case which, if they did not instruct, might amuse your correspondent; but as it is only after all what the Americans would call "a one-horse affair," I have resolved, like Iago, to say not one word more.

Having thus passed, I trust, through this puddle, as a "sunbeam passes through pollution unpolluted," I would direct Mr. Pears' attention to the old proverb, "*Magna est veritas, et prevalitis,*" and enjoin him to remember that "truth is truth to the end of reckoning."

I am yours.

To the Editors of the 'Veterinarian.'

FILARIA OCULI IN THE HORSE.

By A. Smith, V.S., Lecturer on Anatomy and Pathology in the Upper Canada Veterinary School, Toronto, Canada West.

Being a constant reader of the *Veterinarian,* I feel interested in any subject brought under the notice of the profession through the medium of that periodical. I have thought, as veterinary practitioners on this side of the Atlantic are but few in number, a communication on some of the diseases incident to this country may not be unacceptable to the majority of its readers.

The phenomenon of filaria in the eye of the horse comes only within the province of a limited number of our profession, and has generally been described as an affection peculiar to India. It is also met with occasionally on the continent of America, but as far as I can learn, hitherto it has not been noticed in Canada.

The subject of this communication was a chestnut gelding, six years old, of the heavy-draught breed, the property of Mr. Armstrong, a farmer residing in Yorktownship. In the month of May, 1864, the horse was brought into this city, and I was requested to examine him. On inquiry I found that Mr. Armstrong some five or six days previous had observed something amiss with the left eye. The next day the eye appeared to be worse, and on a closer examination a moving object within the eye was visible.

When brought under my notice the worm could be distinctly observed, and the cornea was becoming opaque. The

opacity, however, was not to such an extent but that every movement of the filaria could be plainly seen. The worm appeared to move in every direction, and with remarkable quickness; indeed, a more lively little creature one could scarcely behold. Although this was the first and only case of the kind I had seen, I had not the least difficulty in my diagnosis, nor in giving a correct opinion in the case. I recommended the removal of the worm from the eye at once, and had the horse immediately brought to my infirmary. Before operating I acquainted my friend Mr. Williamson, Veterinary Surgeon, R.A., then quartered in this city, who kindly offered his assistance. I had the horse cast in the usual manner, and properly secured, and with a small lancet I made an incision through the antero-inferior part of the cornea, allowing the aqueous humour to escape, and with it came the little parasite. After the operation the eye was covered with a wet cloth, an active purgative administered, and the horse taken home.

I saw him three days afterwards; the cornea was then opaque, but the eye did not seem very painful. The horse was put to his usual work on the farm, and in the course of four months the eye was apparently perfectly well, with the exception of a small speck where the incision was made.

The worm measured one and a half inches in length, and was thickest in the middle, tapering towards either extremity. In this instance the worm appears to have been very rapidly developed. The spring of 1864 was remarkable for its lateness and heavy rains.

SUCCESSFUL OPERATION OF LITHOTOMY IN THE HORSE.

By D. M'Euchran, M.R.C.V.S., Lecturer on Materia Medica in Upper Canada Veterinary School, Toronto, C.U.

The subject of urinary calculi is one on which veterinary pathology is rather deficient, owing in a great measure to the comparative rarity of their occurrence in the domestic animals; this arising, no doubt, from the active habits of the lower animals promoting quicker digestion, and more complete assimilation of the food, also from the size of the urinary organs and their relative position favouring the escape of calculus nuclei. However, I think with Professor Morton,

"that they are nevertheless present in them more commonly than is thought," and I am convinced that if more attention were paid to the subject, and greater care taken in examining our patients, it would be found that uric diseases are not so very rare after all. A great deal of valuable information on the subject of lithic diathesis, and the use of the microscope, and the application of chemical analysis in the examination of urine and urinary deposits and concretions will be found in a very able work written by Dr. Golding Bird, a careful study of which will enable the practitioner to detect even the earliest traces of calculous tendency.

It cannot be denied that we labour under many disadvantages compared with our brethren of the medical profession, inasmuch as the premonitory symptoms of abnormal irritation of the urinary organs are seldom observed by those in charge of animals, neither is any attention paid by them to gravelly deposits in the urine, even although the horse presents symptoms which in the human subject would at once lead to an examination of that fluid. Very seldom indeed is a calculus suspected to exist until it has attained sufficient size to obstruct the flow of urine, and then the symptoms are so very marked that there is very little difficulty to an observant eye to diagnose the case.

I have always deemed it a duty I owe my profession to bring anything before them which is at all interesting or instructive to them, and I also think it is a duty of every member of the profession to let his professional brethren have the benefit of his experience, more especially on subjects of uncommon occurrence; for it is only by this means that those whose privilege it is to teach can collect practical information beyond the sphere of their own experience, wherewith to instruct those under their tuition. It is with this view, therefore, that I contribute one case more to be added to the records of lithotomy in veterinary pathology.

Report of Case.—On Wednesday, 25th October, 1865, a grey pony, five years old, standing about fourteen and a half hands high, was brought to my stable (at Woodstock, C.U.), presenting unequivocal symptoms of stone in the bladder.

History.—The animal being a recent purchase of the owner, Mr. James Gunn, Ingersoll, I could not learn how long he had shown symptoms of irritation of the bladder. He had been in his possession about a month, during which period he was constantly "doctored for his water," as I was informed, having frequent doses of nitre given him, and other diuretic substances; rudely-made bougies were also thrust

up the urethra, and other cruelties practised upon him, until he became very much emaciated. Being naturally of a vicious temperament, under this cruel treatment he became so much more so that he had to be fed over the stall, and to approach him even was dangerous.

Symptoms.—I found him reduced almost to a skeleton; the countenance haggard and wild-looking. I could not get near him to examine the pulse. The prepuce was considerably excoriated, the legs wet, and the hair in front rough and discolored from the urine constantly dropping on it; he made frequent but almost ineffectual efforts to stale, walked with a straddling almost staggering gait; the appetite, however, was very good, and the bowels regular. I at once suspected the presence of a calculus, either in the bladder or urethra.

Thursday morning, 26th October, I had him cast with the hobbles, and an inspection and examination *per rectum* being made, it at once confirmed my suspicions. A concretion about the size of a bantam's egg could be distinctly felt filling up the neck of the bladder, which was distinguishable from the fæcal pellets by being hard, and resting on the brim of the pelvis.

Having communicated this fact to the owner, and obtained his consent, I proceeded to prepare the animal for the operation by restricting the diet to bran mashes, giving a dose of physic, followed by small doses of Sodæ Bicarb. to neutralize the acidity of the urine.

Operation.—Tuesday morning, 31st October.—Everything being made ready, and the necessary instruments arranged, with sponges, ligatures, &c., at hand, and having the valuable assistance of Dr. Linguand, who volunteered his services, I had the pony cast, and secured on his back, as for castration, in which position he was firmly held by assistants, and propped up with straw. I proceeded to operate as follows: I first emptied the rectum with my hand, and again satisfied myself of the position of the calculus, then withdrawing the penis, I passed up the urethra a gum-elastic catheter, having an ebony point, which on entering the neck of the bladder, at once struck the stone. Having withdrawn the catheter, I introduced a long metallic bougie far enough to pass the curvature of the bulb of the penis, then with a scalpel I made an incision about three inches long in the perineum, on the left side of the raphe, extending up to the side of the anus, and carefully dissecting down on the bend of the instrument, slit open the urethra, and, withdrawing the bougie, passed in a straight grooved sound, which at once

impinged on the stone, and the sound could be distinctly heard by the assistants. Passing in a straight, probe-pointed bistuory in the groove of the director, with the cutting edge directed *outward and downward,** toward the angle of the hip, I slit open the urethra, and with one cut in withdrawing it, made an incision large enough to admit the forceps without injuring any vessel of importance. The forceps were then introduced with the right hand, while the left was passed up the rectum to press the stone forward. There was very little difficulty in taking hold of it, when with a vascillating motion with the right hand, assisted by pressure with the left, I attempted to extract it. From my being too much in a hurry, or from an insufficient hold being obtained, it slipped, crushing part of the stone away, which came out in gravelly particles. I therefore again introduced the bistuory, and enlarged the incision, and this time, as was anticipated and unavoidable, severed a transverse branch of the pudic artery and a lesser perineal artery and vein, from which considerable hæmorrhage took place. Some little difficulty was experienced in taking up the vessels, and considerable blood was lost before they were secured. However, by pressing the artery on the bone I could control the escape of blood, and placing the finger of an assistant on it, I secured the open vessels, and proceeded with the operation. This time I had sufficient room to enable me to take a firm hold of it, and without much difficulty I brought it to the outer opening, when it was discovered to be encysted; a cut or two with the scalpel separated its attachments, and it was removed by the hand.

The debris was now scooped out, and a little tepid water injected so as to wash out the bladder; the upper part of the incision was brought together by one stitch of metallic suture, and a long flexible catheter was introduced and retained by tapes and bandages.

On being released the animal got up, and walked to his box apparently not much the worse for the operation. He was lightly clothed, and had a warm bran mash given him, of which he eat the greater part. Besides this he was ordered well boiled gruel *ad libitum*. At 2 p.m. he was observed to be very stiff in the hind quarters, but very little fever, however, present; pulse 50; he appears perfectly calmed in temper; the urine is dropping from the catheter, some also escaping from the wound; he feeds tolerably well. 5 p.m., he appears lively; is eating a little hay; pulse 45 to 48; the bowels are unmoved since morning. I threw up an

* When placed on his back, outward and upward.

enema of soap and water, which excited a free evacuation of fæces; there is occasional straining to urinate, most of it escaping by the wound; the catheter being evidently stopped, I withdrew it. 8 p.m., he is still cheerful, but cold and shivers a little; had another blanket put over him and his legs bandaged; threw up another injection, and gave him a quart of warm beer, with an ounce of sweet spirits of nitre in it, after which he soon became warm and comfortable; pulse 45; less irritation of the bladder present.

Wednesday morning, November 1st, 8 a.m., the pony is quite cheerful this morning; I had him secured with sidelines, his fore foot being held up by an assistant, and a twitch on his muzzle, and proceeded to dress the wound, having first emptied the rectum with an injection. I then introduced a straight female catheter through the wound, and afterwards injected some tepid water, which washed out some more gravel; this occasioned a little straining, which, however, soon subsided; he continues to feed well. I got the attendant to obtain some of his urine for me during the day; on examining it with the microscope I found the characteristic colorless, transparent, octahedral crystals of *oxalate of lime*. This at once led me to give nitro-muriatic acid instead of carbonate of soda. I ordered the beer to be continued daily, with a little sweet spirits of nitre in it as a diuretic. At 4 p.m., I again inserted the female catheter, and dressed the wound with tepid water. Gave him Aloes Barb. ʒv in bolus, and ordered a few carrots, with bran mashes and a little hay night and morning.

Thursday, 2nd November, patient still progressing favorably; he feeds well, and is quite lively, and this morning his old vicious habits are returning, so that none but the attendant and myself can approach him. However, to us he is quite gentle when the sidelines are on; the urine is discharged in part from the wound and in part from the urethra; the bowels are regular; the pulse 45.

Nothing worthy of remark occurred subsequently, and the same course of treatment was persevered in, viz., dressing the wound with tepid water, regulating the bowels by glysters, giving occasional diuretics, continuing drachm doses of nitro-muriatic acid night and morning, with liberal allowance of good nutritious food, gentle walking exercise, and good grooming. Under this treatment he improved rapidly. On the tenth day the ligatures came away, the wound beautifully granulated, and in fourteen days from the date of the operation the animal had so far recovered as to be able to be removed to his owner's stable, a distance of ten miles.

His perfect recovery was uninterrupted. By the 1st of December he ceased passing urine through the wound, and staled as freely as ever he did through the natural passage; but still the act was accompanied with slight pain.

On the 16th December, the wound was completely cicatrized, leaving almost no blemish whatever, and the urine freely and naturally voided without any pain. During the past winter he has been regularly at work on a farm, and he is now in good condition and as full of metal as ever.

The calculus was a common mulberry concretion, consisting principally of oxalate of lime; it is rough and granular on the surface, of a flattened oval shape, imperfectly laminated in structure, of a blood-stained brown colour externally, but light clay colour internally, emitting a strong uric odour; the outer surface is hard, but it is soft and clayey within, with no well defined nucleus; it weighs 1260 grains.

[We regret the non-appearance of these interesting cases before. It arose from an inadvertence, not however altogether on our part.—Eds.]

ON THE EXAMINATION QUESTION.

By "Nemo."

I have been a constant reader of your valuable journal now for some years, with the exception of a period spent abroad, and having now quietly settled down to practice, I begin to feel a little more interest practically in my profession. I was much pleased in perusing your leading article in this month's *Veterinarian*, in which you inform us respecting Professor Gamgee's intended motion on the examination question. As I understand it, the motion is, that an examination be instituted, and that the subjects be geography, mathematics, classics, or modern languages; and I am led to understand that Professor Gamgee considers that the majority of students, "from their previous habits of life," would not be prepared to pass such an examination on entering the college, but at the expiration of a certain period of study (during which time they would have to be getting prepared to pass another examination on anatomy, physiology, chemistry, and botany) he should then require them to pass the above-mentioned examination, without they could pro-

duce a certificate of having passed a middle-class examination, or that they held some recognised degree.

In my humble opinion the proposition is perfectly absurd. Does Professor Gamgee imagine for one moment that such a man ever breathed who could, in six months or twelve months either, get up three subjects such as geography, mathematics, classics, or modern languages, who is by his previous life unprepared? I say decidedly not; besides, as you very justly remark, it would be obviously unfair to keep a man at college for that length of time, and then tell him to go about his business, as he is not fit to be a veterinary student. We are only as yet a young profession, therefore as we cannot possibly have things exactly as we would like, we must be content with less. In my opinion, if when a student comes up to college he can pass an examination confined simply to our English language, I would let him pass: for if he could do that well, he would not be far behind in other points. Some may laugh at this, and say, How ridiculous,—why any stupid fellow could pass such an examination as that. But I would say to them that there are many who make great pretensions to a vast amount of general knowledge, who cannot even speak and write their own language in a grammatical and correct manner. Let the would-be veterinary student read a page or two out of some good English classical work, and hear where he puts his h's, and how he pronounces his words; if he can do this well, we never need fear that from his previous habits of life he would be unprepared to pass any other examination, for the rest go hand in hand. There was a pamphlet published in 1866, during the time of the Cattle Plague, by a person named Constable, of Wassand, near Hull, in which amongst a quantity of arrant humbug and disgusting egotism there are a few grains of common sense. Speaking of the members of the R.C.V.S., he says,—

"Some, no doubt, will be more or less educated, but look at the mass of the profession. Though many of course are most respectable men, no one can call them a cultured class. And when I complain of their want of culture, I do not mean professional culture so much as the liberal education that leads to that most uncommon of things—common sense, and that kills prejudice, ignorance, bigotry, superstition, and narrowmindedness. Many remember Leech's caricature of the veterinary surgeon, saying,—'If a haitch and a ho and a har and a hess and a he don't spell "orse," my name aint 'Enry 'Olmes.' Now this, of course, proves nothing about the fact as to the culture of the profession, but it proves the popular opinion about the fact, for of popular opinion there is no better meter than 'Punch.' No one could think there would have been any point in the caricature if the speaker had been a physician. Now, in a matter like this, popular opinion is most likely to be right. But if the profession is wanting in

education, and therefore in what a liberal education brings,—that is, common sense and freedom from narrowminded prejudices,—what can be the value of its opinions upon a subject which, like this plague, is somewhat removed from everyday experience? The fact is, that to put causes and effects properly together and to come to right judgments in any new question requires a rare balance of faculties that is seldom found except where, to a symmetrical and clear-seeing nature, has been added that general culture which is best expressed by the term "a liberal education." Look at physicians. With all their culture, what endless confusion of opinion and practice exists amongst them. So what chance has the poor 'Vet?' He cannot help it. He is a poor man, and cannot afford a better education. Still that is no reason all our cows and horses should be killed."

There is no mistake about it; there are a great number of the members of the veterinary profession who are intensely ignorant on all matters not appertaining to their own calling, who seem to have hardly a single idea beyond the stable and cowshed; and if they are spoken to on politics, home or foreign, they are entirely at sea. Some may say, "But what has this to do with our profession?" I say, a great deal; for the more extensive a man's general knowledge is, the more liberal become his ideas, and the more common sense is he able to bring to bear in treating his cases. The veterinary profession is judged by the public at large, not by the R.C.V.S., nor the R.V.C., nor the E.V.C., but by the individual members of the profession who are located in their immediate neighbourhood. Some say that from the nature of our calling having so much to do with grooms, &c., it has necessarily a lowering effect, but I mean to say that, far from that, the profession has, or ought to have, an elevating one; for what can have a greater tendency to ennoble a man's nature than his going about endeavouring to alleviate the sufferings of the poor dumb animals placed under his care. Does society think any less of the surgeon because he is the pauper doctor? or does society think any less of the master manufacturer or machinist, many of whom work all day along with their mechanics and employées? When the manufacturer closes his mill he goes home. When we have finished our daily round we do the same, and it is the society in which we associate there that causes us to be respected or the reverse, not the men with whom we are thrown in contact during our professional labours.

I am a M.R.C.V.S., but I am also a graduate of the Edinburgh Veterinary College; and as that school is my alma mater, it will always have my sympathies; yet, notwithstanding all that, I would rather see it swept from the face of the earth than that it should have a separate charter of incorporation, as I believe that that event would be one of the

greatest misfortunes that could happen to the veterinary profession; and why? Because it would re-establish the old rivalry and competition that was carried on during the lifetime of the late Professor Dick. Not that the competition between the schools would be any detriment (that will always do good, and can still be carried on in a legitimate manner under the one charter), but I am afraid—indeed I am sure—that if the Scotch schools have an independent charter, it would have a tendency to allow the admittance of students who would not otherwise be allowed to enter.

I hope my few remarks will be read in the spirit in which they are written, namely, with the best wishes of the writer for the advancement of the veterinary profession; and the best way to do that is to look the thing fairly in the face, and root out the existing evils, if possible; and this can only be done by each individual member considering himself as representing the whole profession in the locality in which he resides, and by conducting himself in such a manner as to be a credit, and not, as is too frequently the case, a disgrace to the body of which he is a member. I do not fancy myself a paragon, for I know too well my deficiencies, and proud have I been to meet at our social gatherings men who are in every way caclulated to raise us in the eyes of the public, and whom it would be well for a great number of us to imitate.

I enclose my card, hoping you will pardon me for intruding myself on your notice, and taking up so much of your valuable space.

A CASE OF ABSCESS IN THE BRAIN OF A HORSE, FOLLOWING A SEVERE CATARRHAL ATTACK.

By Andrew Mann, M.R.C.V.S., Lambton, Durham.

On the 29th of October, 1867, I was requested to attend a very valuable brown horse, six years old, used as a "crab" horse, and frequently having very heavy lifts. The animal weighed 150 stone. Not being able to see him that day I sent some liniment to rub over his throat, until I saw him the following morning. On my arrival I was astonished at the extent of the discharge sticking around the nostrils. I had him at once removed from his stall to a loose box, when on coming into the air he almost fell on his nose, but, reco-

vering himself, we had no further difficulty in getting him removed.

On examination I could diagnose nothing further than a severe catarrhal affection, accompanied with considerable swelling of the glands, and sore throat. I repeated the application of the liniment to the throat, and had his head introduced into a vapour-bag at least four times a day, which had the effect of producing a favourable change in the character of the discharge. I administered

℞ Liq. Ammon Acet., ʒiij;
Spt. Ether Nit., ʒij;
Potassæ Nit., ʒij.

in the form of draught every eight hours, and ordered his food to consist of bran mashes, linseed and turnips.

After being so treated for six days the animal was evidently better, but still there was a considerable viscid discharge from both nostrils.

I now commenced to give carbonate of ammonia and vegetable tonics twice a day, and on the 24th November the discharge had stopped, the horse was feeding and apparently doing well, and went to work.

On the evening of the 9th December my attention was again directed to him, as he was not feeding so well, and appeared stupid at work. I found him dull, rather unsteady in his gait, bowels slightly constipated, pulse 50, respiration slow, eyelids partially closed, pupils a little dilated. I directed him to be prepared for a dose of physic on the following morning.

10th.—I administered in a ball, Aloes, ʒviij et Hyd. Subchlorid., ʒss. There is no perceptible change in the symptoms.

11th.—I was sent for, the animal being described as much worse; I found him in a comatose state, pressing his head against the side of the box, his legs spread out, and likely to fall on attempting to move him, pulse 92, respiration very slow, visible mucous membranes much injected, iris very much contracted, surface of the body and extremities warm, bowels responding to the cathartic.

I bled until an impression was made on the pulse, applied cold water to the head at short intervals during the night, keeping a man constantly with him. The animal being faint after the bleeding, I had an opening made in the window, when he immediately put his head out, resting his chest against the window-sill. I had a cushion made, which had a good effect in steadying the patient, and facilitating the application of cold water to the head, and also for the

administration of medicine. His body being clothed, he seemed to enjoy the air blowing on his head.

12th.—Morning. A slight improvement has taken place; he is more conscious; the pulse still very quick, but more perceptible. I blistered behind the ears, gave Aloes ʒij, et Hyd. Sub-chlorid. ʒi, in a ball, and continued the cold water over the forehead. At night he was still improving, but no action of the bowels had taken place since the night before. I repeated the ball, and threw up frequent injections of Epsom salts dissolved in water.

13th.—Animal much better; he had taken his head in from the window, and walked several times round the box; drank a few quarts of gruel, and ate a few pieces of bread. The bowels are acting freely. At night he appeared uneasy from flatulence with eructations. Gave Ammon. Carb. ʒij in ball.

14th.—He continues still better; has eaten a few carrots, and drank freely of gruel and linseed infusion; pulse 76, respiration normal, bowels still acting. Administered Ammon. Carb. as before. At night, being much the same, I gave Magnesia ʒiv, in ball.

15th.—He has drank two quarts of new milk, and eaten a little mash, with some carrots. Care to be taken not to give him too much. I repeated the magnesia and injections, and contiuued to apply cold water to the head.

16th.—He seemed not so well; kept his head out of the window, and took part only of his food of milk, &c. Repeated the magnesia.

17th.—Again livelier; the pulse improved in tone, and he comes to you when called; he is inclined to eat more than is thought prudent to give him.

I consider it unnecessary to give in detail the treatment throughout the case. Suffice it to say the animal continued alternately to be better and then worse, generally becoming worse in the afternoon; and at such times, always voluntarily putting his head out at the window, and he continued in this state until December 22nd, when he died.

Post-mortem Appearances.—Abdominal and thoracic viscera healthy; the carcass excessively fat; the nasal chambers and guttural pouches healthy, and free of any extraneous matter. On removing the brain I was surprised at finding nearly three ounces of pure pus in the left hemisphere of the cerebrum; the brain itself and membranes were of course congested.

Does this case not tend to show what may sometimes follow a case of simple influenza?

INFLUENZA COMPLICATED WITH PNEUMONIA?

By Jeffery Barton, V.S., Dover.

Will you kindly allow me a small place in your valuable Journal to report on a disease which is entirely new to me, and even to some old practitioners to whom I have named it. It is one which has been, and is now, very prevalent among horses in this neighbourhood. For the last four months I have been engaged night and day with a great number, which were very similarly affected to each other.

The first symptom presented was a dull, heavy appearance of the eyes, the membranes of which shortly became fearfully injected; drooping of the head; coat greasy, and lying close to the skin; and in twenty-four hours the animal so much prostrated, that with great difficulty he could be removed to a loose box, or even turned in the stable; then follow a slight heavy cough, pulse very feeble, fore legs placed wide apart, the horse never lying down; effusion soon supervenes into the thorax; the legs then alternate from hot to cold and *vice versâ* rapidly; the fæces are tinged with blood, the urine thick and dark-coloured; and the respiration very laborious, with a rattling noise in the head.

I had two ponies standing in one stable thus affected, and they were so excessively weak that they could hardly stand. They have, however, recovered.

Facts and Observations.

Practical Benefits of the "Spectrum," in the Bessemer Process of obtaining Iron.—M. Lielegg has made some observations on the flame coming from furnaces, in which iron is worked solely by the Bessemer process, which is carbonic oxide in a state of incandescence. He further states the appearance and disappearance of spectral lines mark the progress of the metallurgical operations. At the moment when the decarbonisation of the iron commences, and when it has reached the proper limit, these lines suffer essential modifications. The appearance of a group of lines, and of one distinct line at the violet end, marks an important stage during the formation of malleable iron: these lines disappear sooner than any of the others, this effect taking place within the last five minutes of the operation, so that they serve to denote the termination.—*Chemical News.*

The Directorship of the Belgium Veterinary Schools.—We have the pleasure to announce, that Professor Thiernesse has been appointed Director and Principal Professor of the National School of Veterinary Medicine of Belgium, in the place of Professor Delwart, who, at his own request, has been placed on the retired list.

Albert Veterinary College.—This undertaking is about to be wound up by common consent, as the speculation has been altogether an unfortunate one.—*Mark Lane Express.*

Protection of Animals against Attacks of Flies.—Mr. Martin, veterinary surgeon of Provence, has discovered a simple but infallible means of securing animals from this plague. He employs a lotion composed of sixty grains of assafœtida dissolved in about two ounces of vinegar, diluted with two ounces of water, which is sponged over the parts of the body most exposed to the attacks of the insects. It is asserted, that so long as a trace of the compound remains on the skin, flies will not approach the animal.

The Cattle Plague.—The *Gazette* contains an Order in Council announcing that the Order dated October 4th, 1866, and which relates to the introduction of cattle into England and Wales from Ireland or Scotland, is revoked.

Action of the Alkaline Silicates on the Animal Economy.—M. Husson experimented on dogs, giving to them a solution of the silicate of sodium; they were afterwards killed, and the organs submitted to chemical examination, when it was found that when the silicate is given in such small quantities as that the contents of the stomach remain acid, it is completely decomposed, and the same is the case when given in very dilute solution. The intestinal juices are unable to redissolve the silica. It follows that the alkaline silicates can only enter the blood when administered in a sufficient quantity to be alkaline in the small intestines. Traces only are found in the blood. No deposit forms in the brain, the liver, the bile, or the bones; but the muscles contain appreciable quantities of precipitated silica, as does the spleen. By far, however, the largest quantity of silica is precipitated by the urine, in the form of silicic acid and silicate of lime. M. Husson explains the precipitation in the muscles as being due to the acid developed during exertion, biphosphate of sodium playing the same part in the urinary deposit. The symptoms produced are, turbidity of

urine, difficulty in voiding it, and congestion of the kidneys. —*Chemical News.*

Use of Carbolic Acid in Contagious Diseases.—It having been considered by some physiologists that many diseases of a contagious nature owe their origin to sphorules or germs of certain animal or vegetable ferments which penetrate with the air into the blood, since in this fluid in carbuncle has been detected vibrios and bacteria, and the presence of vegetables or animals in the blood of man and animals affected with other diseases, it has been proposed to treat such diseases with that powerful antiseptic, carbolic acid, which by inducing a new action in the blood, will completely alter the nature of that fluid.

To convert Iron into Steel.—For this purpose a modification of Mr. Bessemer's process appears to be adopted by M. Galz-Cazalat, who passes super-heated steam into the fused iron instead of atmospheric air. As the steam traverses the mass it becomes decomposed, the oxygen burns up the carbon and oxide of iron, while the hydrogen removes the sulphur, phosphorus, and other metalloids which render the steel brittle. When the colour of the flame at the top of the mass indicates a proper amount of decarburation, the process is complete. It is this last which is so difficult to arrive at a knowledge of.

The Metal Titanium.—Titanium appears to be largely disseminated in nature; and considerable quantities, it is said, are now being obtained in Birmingham by reduction from its ores by means of sodium. It closely resembles iron in its properties.

Formic Acid.—This acid, according to M. Jodin, possesses, to a greater extent even than carbolic acid, the power of preventing the formation of living organisms in fermentable or putrefiable matters.

Medicinal Action of Picric Acid.—This acid has been stated to be an efficacious remedy in intermittent fevers. Persons affected with this type of disease, and upon whom quinine has lost its beneficial action by long-continued use, derive, it is said, great relief from the substitution of picric acid and the picrates, as proved by Dr. Aspland at the Military Hospital at Dukenfield. Thus picric acid furnishes a cheap febrifuge, while it is not dangerous, as arsenical preparations are, nor does it derange the stomach like quinine.

THE VETERINARIAN, MARCH 1, 1868.

Ne quid falsi dicere audeat, ne quid veri non audeat.—CICERO.

BOTANY IN CONNECTION WITH VETERINARY MEDICINE.

WE elsewhere insert some extracts from an address delivered by Professor Bentley, F.L.S., at the late "British Pharmaceutical Conference," considering them not inapplicable to the science of veterinary medicine, nor inopportune, now that an effort is being made to introduce instructions in botany in our schools. And surely it cannot be said that the pharmaceutical chemist needs to be better taught, or be more familiar with the action of certain plants, medicinal or otherwise, than the practitioner of veterinary medicine; nevertheless, so it is, since lectures on botany, with other aids to the acquirement of a knowledge of this division of natural philosophy, have been possessed by the former for some time, and not by the latter. Let us hope that this will not continue to be the case much longer.

We have ever been, and must continue to be, from a conviction of its desirability, not to say necessity, earnest advocates for botany being made an integral part of the curriculum of the student of veterinary medicine. Indeed, we have gone so far as to assert that this division of science is of more real use to him than to the student of human medicine, since how frequently is it the case that animals partake of vegetables which often, arising, it may be said, from accidental circumstances, prove poisonous to them, and death follows? Did we want a practical application of the advantages that would result from botany being taught in our schools, we might, with no little confidence, refer to the papers on that science, now for a time interrupted, which have appeared in this Journal.

We are quite satisfied that the most superficial thought being given to the subject must result in a conviction of the benefits we, as a profession, should derive from its recognition by the schools. Then, again, how admirably would it tend to fill up a summer course of lectures, which

in every sense are so desirable for the student, as his mind would then not lose the healthy tone imparted to it by the winter lectures, but by his thoughts being directed to another branch of his studies, and this acting as a relaxation, fresh mental vigour would be given, and the intellectual powers strengthened; while all this would be attended with the pleasing assurance that he was acquiring that kind of knowledge which in after life would be satisfactorily and profitably applied by him.

We might go on to observe further that a study of the natural sciences generally cannot fail to invigorate the mind and ennoble man, whilst at the same time it inculcates method and a love of observation. Adverting to this, one of the first statesmen and the greatest orator of the day has said—

"It is a most delightful and most valuable pursuit. It has many branches; but I refer, of course, particularly to the knowledge of plants, flowers, trees, birds, insects, animals. These are the things that lie nearest at hand, and which I have principally in view. One of its uses is that it is a most religious pursuit; it is hardly possible for a man to become acquainted in any degree with the boundless wealth and fertility of nature, and with the wonderful wisdom of all its arrangements, without having his mind, I will not say forced, but won, led, attracted in the gentlest but firmest manner to the thought of that wise and beneficent Providence which has contrived all these things, and contrived them to make a world which should not only be full of what should supply our primary wants, but should be full also of everything that by the presentation to us of beautiful objects can train the imagination and the taste, and feed us with rich and innocent delight. For the study of natural history does many more things than that. What a discipline for the sciences! Look at the acuteness and activity of eye that a person acquires who is accustomed to watch objects as he goes along; and the activity of eye which he so acquires is not limited to those objects alone. It affects his general habits in the use of the eye, and it makes him pass through all the scenes of life with a generous observation and a greater faculty of benefiting by what he sees. There is another use in natural history. It has a singular effect in enriching the mind; it provides the most apt subjects of illustration in discourse. A man who knows natural history can always converse with greater in-

terest. Almost everything he sees in human life and experience is capable of being illustrated from the realm of outward nature, and I am persuaded that those who look to the mere exterior of these branches of knowledge sadly delude themselves when they see a lot of dry plants in a book, and say that the knowledge of those plants after all is a very dry affair. They little know what lies below the surface, and in how many and in how good and useful ways the knowledge of these very kingdoms of nature, or some of these kingdoms of nature, assists them in the performance of their duties and in the fulfilment of those purposes of life which the great King of Nature—who is the Almighty—has appointed for man himself."

Moreover, it is more than a false supposition, and we enter our protest against it, that there is anything antagonistic in the study of the sciences and the truths of revelation. Heartily do we endorse the following sentiments:—"The same power that permitted or inspired the prophets and apostles of old to reveal the Divine Will to man has permitted and still permits man to discover some of the hidden mysteries of the universe. It is indisputable that the laws by which material things are governed have the same Lawgiver as those which regulate the spiritual world. The law of inverse squares is not more wonderful or more easy to grasp its origin, permanence, and constancy than the scheme of man's redemption and future happiness; only in the one case men can see and appreciate the induction which led to the discovery of the law; while in the other the faith which converts the doctrine of his redemption into a living vital truth is not so easily commanded."

We have been always sincere advocates for scientific study, much of which is a self-educating process, and must go on throughout life. "There ought to be," says one of the greatest thinkers of the day, "a self-directing process of improving the mind carried on by every one according to the means which every man possesses. Education, so viewed, divides itself into two great heads—namely, the one which goes to the training of the mind and fitting a human being generally, by the improvement of his faculties, for all purposes whatever; the other goes rather to store the mind

with regard to those practical means which may be adapted for his particular profession or occupation in life."

The late Professor Faraday, in a lecture delivered before the Prince Consort, said, "High as man is placed above the creatures around him, there is a higher and a far more exalted position within his views, and the ways are infinite in which he occupies his thoughts about the fears, or hopes, or expectations of a future life. I believe that the truth of that future cannot be brought to his knowledge by any exertion of his mental powers, however exalted they may be; that it is made known to him by other teaching than his own, and is received through simple belief of the testimony given. I may be reproached with the weakness of refusing to apply those mental operations which I think good in high things to the very highest. I am content to bear the reproach. I have never seen anything incompatible between those things of man which can be known by the spirit of man which is within him, and those higher things concerning his future which he cannot know but by the Spirit."

In like manner, Dr. Miller avers that although there is a lurking suspicion in the minds of some persons that the tendency of scientific inquiry is to undermine the foundations of faith, the alarm will be found to be groundless when once the subject is fairly examined into. This feeling of distrust, he says, "may arise partly from the want of a sufficiently clear distinction between the objects for which the Bible was given and those for which science is pursued. The Bible and the world in which we live proceed from the same Almighty Author. Both, consequently, must bear the impress of his character, and both may be expected to present to the finite intelligence of man, not only difficulties which he is unable to solve, but mysteries which he cannot fully comprehend."

Holding the same views as those above enunciated, we have preferred selecting from the writings of others, whose names are familiar to our readers as "household words," rather than give our own opinions in detail. These are some of the depths that reason cannot define nor philosophy

fathom: all we can do is to wonder and adore, or, adopting the words of Sir J. Herschel, say "no doubt the testimony of natural reason, on whatever exercised, must of necessity stop short of those truths which it is the object of revelation to make known; but while it places the existence and principal attributes of a Deity on such grounds as to render doubt absurd, and Atheism ridiculous, it unquestionably opposes no natural or necessary obstacle to further progress."

At the present time, when the question of education is that which is calling forth the energies of the most active and best instructed minds, no apology need be offered for its consideration by us, since it is demanded of us as a body that we keep pace with the progress that is being made all around. Philosophers, philanthropists, statesmen, and men of science all concur that the time is come when the masses must be educated, and that not merely in the three R's, as they have been facetiously designated, but solid, substantial instruction must be communicated, embracing the sciences generally. Nor is this confined to our own country, which hitherto has been sadly remiss, but other and less favoured and less civilised ones are being awakened to the value of knowledge and its application to every-day life. Hence what is called technical education is the prominent topic of the day, and by it doubtless the mind becomes expanded and better fitted to exercise control over the baser passions, while the whole man becomes both refined and rendered more useful to his fellow man.

We have no desire, nor is it our province, to enter upon the full bearings of this important question. "He who runs can read" what is taking place, or he must be mentally blind. But confining our remarks to physical science, it has been well observed by the Hon. R. Lowe, M.P., that "its study is bracing to the mind, it teaches us to compare closely, to observe, and to think, and to distrust our crude and first generalizations. It perhaps does not so much teach us science as produce a scientific habit of mind, to correct by careful observation, and which carried into business, keeps us from mental bankruptcy." In his opinion nothing is so requisite in middle-class education as a study of

the phenomena of physical science. "The study of nature," he says, "should precede the study of books." Our universities, although reluctantly, are at length becoming convinced of this, and are adopting a new curriculum, embracing the physical sciences, and the same thing is obtaining in the different colleges and the larger public schools; thus they are awakening to a new life, and proving "the mind's the standard of the man"; and thus it is, that in the end the entire social body will become permeated with knowledge. We believe a sufficient reason might be assigned for the above observations, which by some persons might be thought a little foreign to our pages, in the science of botany finding a place among the subjects for the examination of the pupil in the scheme lately proposed by Professor Gamgee, and to which we have given a qualified approval, believing that as yet some things suggested by him cannot be adopted; nevertheless, a modification of it being determined upon will tend to the increase of the efficiency of the veterinary surgeon by a higher qualification being required at his examination for a diploma.

Although as yet botany is not taught in our schools, the sooner it is the better. We have before indicated a way for its being done, one both simple and practicable, and which would benefit alike the schools and the profession. We can also remember that attempts were once made to effect this, but they were then considered uncalled for and premature, and were not recognised. Happily it is not so now, as mind-progress since then has made a rapid march, demanding our being on the alert, or becoming distanced in the race.

THE HORSE-FLESH BANQUET.

This banquet, which had been the talk of the town for many days, and had also excited some interest in several of the great cities of the continent, came off at the Langham Hotel on the evening of the 6th ult. The chair was taken by Mr. Forsyth, Q.C., who was supported by about 160 gentlemen, many of whom are distinguished for their posi-

tion in the literary and scientific world. As a gathering of gentlemen, having for their chief object the removal of a national prejudice, the meeting must be considered a success; but, as a banquet to prove the excellence of horseflesh as a meat diet, it cannot be viewed other than a failure. To our mind there were many things to complain of in the management, some of which were easy of prevention. The attention on the part of the waiters to the requirements of the guests was sadly defective. Vegetables could not be obtained by any ordinary means, nor could gravies or sauces to eat with fish, excepting a dirty-looking mixture of horse-flesh dripping. Several gentlemen who sat near us were absolutely compelled to eat their salmon without a drop of lobster or shrimp sauce, or ordinary melted butter; nor could they even get a potato to help it down. Later on in the dinner the same ill-luck attended those who sought a little change from overdone, lean, and stringy horse-flesh by selecting roast turkey stuffed with chestnuts—(query, horse-chestnuts). The birds looked anything but inviting, for their appearance was that of having been roasted with the horseflesh and basted with its dripping. Worse than all this, was the way the carvers plied their avocation. Some half-dozen men were assembled round an extemporized sideboard in the centre of the room to carve the fowls and meats, who proved to demonstration that fingers were made before forks. We were led to ask ourselves whether these men had been sent by the knacker, or the cats'-meat man, such adepts did they seem at cutting slices and pitching them with their fingers into the empty plates. Perhaps they had come to the conclusion that this was just the right sort of thing at a dinner where gentlemen had assembled to deprive poor pussy of her daily meal.

Folly, too, went hand in hand with mismanagement and inconsistency. It reached its climax when the baron of horseflesh was brought into the dining-hall. Alluding to this event, the writer in the "Telegraph" says:—

A surprise ushered in the second service. While the company were discussing *petits pâtés à la moëlle Bucéphale*, the notes of a trumpet sounded through the room. After a fanfare, the first bars of "The Roast Beef of Old England" evoked peals of laughter. The tune was continued; and

presently, looking towards the door at the end of the hall, the diners beheld a portly personage, dressed in a herald's tabard, who, without ceasing to play the good old air, marched forward in front of a trophy—no less than a baron of horse, borne by four cooks in their white caps, jackets, and aprons. Up to the farthest end of the room, and down again as far as the middle, where was placed a buffet, went the herald, and the four cooks, and the baron of what looked like beef, and wasn't. When the mighty dish was laid down, slice after slice was cut till the weight of the baron must have been sensibly reduced.

Anything more ridiculous than this parade we have seldom witnessed, and to see it countenanced by clergymen, barristers, physicians, and *literati* of the metropolis rising from their seats, and receiving it with cheers, was perfectly astounding. The baron was said to have weighed 280 lbs. and to have taken some twelve hours to cook. It was cut from a four-year old horse, while the roast fillet on the buffet was furnished by a twenty-year old. In common with many others we had resolved to taste the baron, and were fortunate, through a friend, in getting a well-done slice. It was palatable, but as to its venison flavour of which we have since heard so much, we can only wish that we had recognized it at the time. Two things we certainly did approve of, and can speak in their praise, viz., the clear soup and the foals'-foot jelly. Both, however, had a peculiar flavour which is perhaps best described by the term horsey. Indeed, it reminded us of the smell of a stable.

In expressing thus freely our impressions of this banquet, we are not desirous of being understood as opponents to the introduction of a new kind of food. Anything which will enable the poor man to get two meals of meat in the place of one, has our support and our efforts too. That horse-flesh is eatable we admit, and a plain-cooked steak cut from a young horse in good condition we remember to have eaten with a relish many a year ago. At the Langham banquet the art of cookery failed completely, and to our mind it spoiled that which otherwise was palatable. Rightly has it been observed by one of our public writers, that—

If the hippophagic movement is not to go beyond the limits of scientific sport, the publicity which has already been given to it has been ill-bestowed; but if it is really intended to confer a boon on the poor in the shape of a new, cheap, and wholesome article of food, the sooner the horse-eaters go to work and reduce their theories to practice the better. Let us have no more of this nonsense about Bucephalus soup and Pegasus patties,

about *huile chevaleresque* and "Arab" *entrées*. The fairest way to discover whether the public will eat horse is to open a couple of butchers' shops in the most populous districts of London, provide a good stock of horse joints, chops, steaks, hearts, liver, &c., and then see whether the public will buy, and, more, whether they like, the "new meat."

Since the Langham banquet others have been held at the Crystal Palace, Ramsgate, Sheffield, &c.

A correspondent has sent us the following account of the dinner at Sheffield, which will be read with interest and also with amusement.

HIPPOPHAGY IN SHEFFIELD.

On Wednesday last a gentleman of well-known experience in living horse-flesh, and for whose opinion half-guineas have been freely paid, entertained a few of his friends at a dinner-party, to which they were invited to judge of the merits of a steak from the best parts of this useful animal. A fine healthy horse, eight years old, was slaughtered in the proper manner, and selected joints hung up in the larder, in order to acquire the tenderness which results from a similar treatment of beef and mutton. The cook was not taken into confidence, and accordingly looked upon the meat as ordinary beef, which it very much resembles. The viands were prepared for the table in the simplest possible manner, in order that a fair judgment might be passed upon the actual flavour of the meat. The party, which included two ladies, was unanimous in pronouncing a favourable opinion upon the dish placed before them. Whatever economical results may flow from the extended use of this class of food, it is certainiy an acquisition to our bill of fare, and something tangible is gained by overcoming any prejudice against eating so clean feeding a beast as a horse. The testimony from so highly respectable a source is unimpeachable, and we are informed that under another name, *cotelette de cheval*, would be partaken of by the most fastidious with as much enjoyment as the time-honoured chops and steaks.

THE LATE HORSEFLESH BANQUET IN SHEFFIELD.

One of the guests invited to the late banquet of horseflesh, who seems to have freely partaken of all the good things provided on the occasion, has furnished us with the following particulars :—"The guests assembled slowly; it was afterwards discovered that ten, at least, had passed and repassed the door several times, as I have done myself in keeping appointments with the dentist. The inevitable half-hour was spent in the usual interchange of small-talk, one gentleman being noticed as simulating a hilarity very unusual to him. As the hour of six approached, the conversation flagged. A guest broke the solemn pause by expressing a hope that cook would be punctual, as he had eaten nothing since breakfast. Our cheerful friend thought a few minutes spent on the seasoning would not be thrown away. At this moment a servant entered with a few notes, which the host, upon perusal, announced to be excuses from some invited guests. All pleaded very urgent and sudden business, expressed immense regret, and did not fail to wind up with a fervent hope that the party would go off well and the meat be apprcciated. 'Well, never mind,' chcerily remarked my neighbour, 'there will be so much more for us to eat,'—a pleasantry which did not meet with the response its generous sentiment deserved. The hilarious gentleman, indeed, for a few moments, seemed quite depressed

at the disappointment. Dinner at last was announced. The door thrown open brought us into the steamy air pervading the passage from the kitchen to the dining-room. An odour of an indescribable character assailed our nostrils; much of its peculiarity, however, seemed familiar to me. It is possible I have met with it before. One guest next to me hastily put up his handkerchief to his mouth, murmuring something about neuralgia and draughts of cold air. Several others I observed to be afflicted with coughs, and cleared their throats vigorously. This is not to be wondered at, considering the changeable weather we have had lately. I sat opposite our cheerful friend and next to the hungry man. The dish so long expected at length was brought in. No one spoke until the cover was removed, when my fasting friend hastily poured out some water and drank it off, saying he really was afraid he had gone past the time and had lost his appetite. A quiet guest who seemed somewhat shy, here said that he had, unfortunately, had his luncheon very late, but hoped to do justice to the fare. The funny man said something about a shilling a mile, cab fares, and how to break fast horses, but I didn't see the joke, except that he broke out into a horse laugh at his own witticisms. Each of us was supplied with the brown morsel; condiments, including horse-radish, were partaken of freely. I thought with undue precipitation, the cheerful guest proposed the health of the host in a bumper of champagne. I confess the meat wasn't bad, and when I shut my eyes, which I did upon taking a mouthful—indeed I kept them off my plate as much as possible—I don't think I should have known it from ordinary steak. There was no doubt the dinner was a success. The merry man boisterously asked for another help, one or two followed his example, but I observed that it must be a very satisfying meat, for none appeared to get through the second plateful. Potatoes seemed much in demand, and sherry was taken with one another very frequently. The hungry man had left off long before the others, when I noticed the hilarious guest, who had been much quieter, seemed to get very pale. The shy man at this juncture, feebly suggested that after such a rich dinner a *petit verre* of Cognac would not be amiss. This proposition was instantaneously seconded by the entire party; and I can assure you that the contents of the bottle which was passed round were not less praised than the rest of the dinner. For myself, I feel that I am glad I have overcome a natural prejudice, for it is a duty to society, and I don't see that I shall be called upon to do it again. I look upon my starving fellow-creatures, and I say, there, eat, and be filled; plenty is driving about the streets of your city. We spent a very pleasant evening. I do not recollect very clearly what took place after the cloth was removed; but upon separating I heard our generous host begging us to stay a little longer, and saying that he could soon make us up a bit of supper, a *réchauffé* or some cold meat, but this offer was most precipitately declined; and I was dragged out of the half-open doorway by the hungry man, in so much haste, that I left a very good umbrella behind me. I think the smell from the kitchen somewhat confused me."—*Sheffield Independent.*

As a record of the great feast at the Langham we insert the bill of fare, and therewith close our remarks for the present on Modern Hippophagy.

BANQUET HIPPOPHAGIQUE.

Langham Hotel, Portland Place.

Le 6 Fevrier, 1868.

"Les préjugés sont des maladies de l'esprit humain."

Menu.

POTAGES.

Le consommé de cheval à l'A B C. A la pureé de destriers.
Amontillado.

POISSONS.

Le saumon à la sauce Arabe. Les filets de soles à l'huile hippophagique.
Vin du Rhin.

HORS D'ŒUVRES.

Les terrines de foie maigre chevalines.
Les saucissons de cheval aux pistaches Syriaques.
Xeres.

RELEVES.

Le filet de Pégase roti aux pommes de terre à la crême.
Le dinde aux châtaignes.
L'Aloyau de cheval farci à la Centaur aux Choux de Bruxelles.
La culotte de cheval braiseé aux chevaux-de frise.
Champagne sec.

ENTREES.

Les petits pâtés à la moëlle Bucéphale.
Kromeskye à la Gladiateur. Les poulets garnis à l'hippogriffe.
Les langues de cheval á la Troyenne.
Chateau Perayne.

Second Service.

ROTS.

Les Canards sauvages. Les Pluviers.
Volnay.
Les mayonnaises de homard à l'huile Rosinante.
Les petits pois à la Française. Les choux-fleurs au parmesan.

ENTREMETS.

La geleé de pieds de cheval au marasquin.
Les zéphirs sautés à l'huile chevalresque. Le gâteau vétérinaire à la Ducroix.
Les feuillantines aux pommes des Hespérides.
St. Peray.

GLACES.

De crême aux truffes. Sorbets contre-préjugés.
Liqueurs.

DESSERT.

Vins fins de Bordeaux. Madère.
Café.

BUFFET.

Collared horse-head. Baron of horse. Boiled withers.

Review.

Quid sit pulchrum, quid turpe, quid utile, quid non.—Hor.

Guinea Worm in Dracunculus; its symptoms and progress, causes, pathological anatomy, results, and radical cure. By J. Africanus B. Horton, M.D. Edin. J. Churchill and Sons.

This brochure, which consists of fifty pages of good type, gives a very practical account of the disease produced by the Dracunculus in West Africa, where the author served as staff assistant-surgeon to H.M. forces. In his preface he says: "The present Abyssinian campaign has brought into prominent discussion the subject of Guinea worm, and as there appeared to be from the publications lately in non-medical journals a great many mistakes in the description and character of this disease," he had submitted the observations which he had made while located with the army in the Gold Coast, West Africa.

The researches of scientific investigators, having for their immediate object practical deductions, possess a value which far exceeds that belonging to those of the more practical observers, and such we find to belong to the labours of Mr. Horton.

In the purely scientific portion of the essay little addition is made to our former knowledge of the structure and development of this formidable parasite; but it is pleasing to observe that the author confirms everything of value which has been written on the subject by modern helminthologists.

He repudiates the views of those who had spoken of the worm as entering the organism through the digestive system, and brings forward good proof that it is received in its embryonic condition through the skin, and probably through the sudorific ducts. He also confirms the statement that viviparous female worms alone are the inhabitants of the tissues, and although he does not describe this reproductive process, he seemingly inclines to the view of Bastian that it is allied to parthenogenisis.

In our view of this question, the young female Dracunculus is impregnated while living in watery and muddy places, and in this condition she seeks a habitat within the

subcutaneous tissues of an animal where her embryos are perfected.

During this incubative period, which seems greatly to vary in different cases, the infected person is ignorant of his being a worm bearer, but as soon as the young dracunculi are fitted to occupy an independent existence, the parent worm makes an effort to escape, and then all the sad symptoms which are known to the surgeon disclose themselves. A necessity now arises, according to most practitioners, for a removal of the worm, and the plan for this which our author advocates is identical with that which nature has established.

There is, however, something more which can be done, and according to Mr. Horton the worm is readily destroyed without removal, and in effecting this, all the ill-consequences of its presence are found speedily to cease. This desideratum is effected by a free use of assafœtida given in the form of tincture.

The destruction of entozoa within the tissues is a matter of the highest importance to the medical practitioner, and equally so to the veterinary surgeon, among whose patients diseases of the most serious kind are produced by parasites. The essay is well worth an attentive perusal, and we earnestly recommend it to our readers. It is an opportune gift to the medical and veterinary staff of the army, and particularly to those now acting with their regiments in Abyssinia.

Extracts from British and Foreign Journals.

THE MORTALITY AMONG THE HORSES AND MULES IN ABYSSINIA.

By G. Fleming, M.R.C.V.S., Royal Engineers.

We shall extract largely from the communication sent to us by Mr. Fleming on the above subject, it being so full of interest. He says,—

"So far from the disease being a novelty, there are few equine disorders, besides those peculiar to horses in this country, which have received a greater amount of attention, or whose effects have been more marked than this one. It is nothing more or less than the well-known 'horse sickness'

of the Cape colonist, the 'Paard-ziekte' of the Dutch boer. From the earliest times it has ravaged the farmers' teams and droves in that quarter of South Africa, and has been noticed and commented upon by nearly every African traveller. Those of your readers who desire further information concerning it I would refer to Anderssen's and Livingstone's writings more particularly. Sir W. Baker, in his recent work on the Albert N'yanza, describes it as attacking his animals on his progress towards the sources of the Nile. The symptoms enumerated by these travellers entirely agree with those given to us by correspondents now attached to the force in Abyssinia.

"One of the most recent travellers, Dr. Scherzer, in his narrative of the voyage of the Austrian frigate 'Novara,' affords us so very concise a description of it and its effects that I venture to transcribe it. He says, 'During our residence in the Cape Colony (in 1857) severe depression existed among the agricultural inhabitants of the western and eastern districts, in consequence of an epidemic which, within two years, had carried off 64,850 horses (draught horses, mares, and foals), of the value of £525,000 sterling. Many landowners in consequence entirely gave up rearing horses, and turned their attention almost exclusively to the breeding of sheep. The visitations of this malady are by no means of late introduction, but hitherto they have made their appearance at such long intervals, that but little attention was paid to them, and people regarded their return without much alarm. This disease of the horse, usually endemic in Cape Colony, assumed every twenty years, owing to some inexplicable causes, an epidemic character, and on those occasions extended over an extensive area, as happened with extraordinary regularity in the years 1780, 1801, 1819, 1839, and 1854. Hitherto no further precaution was taken than, so soon as the disease appeared, to drive the horses from the grass pastures to their stables or covered sheds, and there supply them with fodder, the night dew being considered a main cause of the complaint.

"A resident in Stellenbosch, indeed, maintained that the dew which was deposited during the continuance of the disease tasted quite bitter, and was of an unusual brownish tinge. Singular to say, not the slightest symptoms of illness manifested themselves in the swine, dogs, and birds of prey which devoured the carcases of horses that died of the disease, while the consumption, whether boiled or roasted, of mutton which was ever so slightly tainted with the mere germ of this malady, never failed to produce the most mis-

chievous consequences on the human species.* Considering the importance of the subject to a land-holding colony, it could hardly fail that numerous individuals should devote themselves to elucidating the causes of the devastating epidemic; but it must ever remain a striking and significant fact, illustrative of the high standard of cultivation in Cape Colony, that within a very few years 112 different authors published treatises respecting this complaint among the horses. The result of these numerous researches was that the malady is epidemic, but not contagious; that horses driven into the stable before sunset, and not permitted to go out to pasture, are, as a rule, exempted from attack; that those horses which are kept at night in open pounds, or in places where there are heaps of dung, take the disease in a milder form than if suffered to roam at large day and night; lastly, that horses for which no covered shelter can be provided, may, with great advantage, be sent to hilly localities and dry runs of land. The practical remedy which was most resorted to consisted in immediate and prolonged bleeding, pushed to actual exhaustion of the animal, in the first stage of the disease.

"From the various accounts I have perused, I learn that the disease only attacks solipedes—horses, asses, and mules; and even during severe epizootics, zebras and quaggas have been found dead in their native haunts, with the characteristic foam filling their nostrils. Ruminant animals are exempted from its attacks; so that, while horses and mules are dying on every side, cows, oxen, and sheep are unaffected. A strange feature in its character is its clinging tenaciously to low lands, and never attacking horses or mules above a certain altitude. Burchell, who travelled in South Africa in 1811, mentions this fact on one or two occasions. For instance, when at the Roggeveld Mountains, near the borders of the Cape Colony, he writes,—'The Hantamberg, lying in the direction of N.N.W. from the Roggeveld Mountains, is said to be very high land, and is remarkable for being one of the few situations in this part of the country where horses are not liable to the horse-sickness, which rages during the summer season, and annually carries off great numbers.' When speaking of the seasons at Klaarwater, he further remarks,—'After the middle of October no frost is expected for seven months; but in the mornings of May it is always found to return, and is the signal for the return of their horses from

* This is an error. Sheep are not liable to this disease, but to another which bears no analogy to it, which renders their flesh poisonous.

the Roggeveld, whither they are sent in January to avoid the paard-zeikte—a fatal distemper to which they are liable in the hotter months. Those who object to send their horses to so great a distance from the settlement are content to run the risk of keeping them in the Langberg (Long Mountain), an elevated mountainous country, lying in a W.N.W. direction. This, however, not being so cold as the Roggeveld, is less safely to be depended on. It does not seem that the distemper acquires its full force until the beginning of February; but after then the lower districts of the whole of the extra-tropical part of Southern Africa are, as far as my information enables me to speak, subject to its baneful effects. Experience has shown that the first frost, whenever it happens, fortunately puts a stop to its further ravages.' And again, at the same place, in January, 1812, he remarks,—'As the season for the paard-zeikte was expected to begin, generally, about the beginning of February, a party of people set out this day for the colony, taking with them a great number of horses, with which they were to remain till the 1st of May, at a farm in the Roggeveld, belonging to a boer named Franz Maritz. Many of these people had this year sent more than half their horses into the colony; the other half, in order to be nearer at hand in case of hostilities with any of the neighbouring tribes, were sent off at the same time for the Langberg, under the care of a stronger party. In a former year, when they preferred running the risk of keeping them at the village in the Asbestos Mountains, out of eighty horses there died of this distemper not fewer than seventy. . . . They (the Langberg Mountains) appeared to be very lofty, and it was said that on the other side there is little descent, the country continuing at the same high level, which fact, as the air must there be colder than in the lower plains about Klaarwater, has induced the Hottentots to keep their horses there during the season of the paard-ziekte. There is also another elevated tract between Langberg and the Kloof, where horses are also kept, and which is therefore named Paardberg (Horse Mountain).'

"And Anderssen states, in 1856,—'We had only been a short time at Richterfeldt when three of our mules and the remaining horse were seized with a mortal disease, and in the course of a few hours they all died. Though the loss of the animals was great to us, their death was a god-send to the poor Damaras, who devoured the carcases bodily, and without the disagreeable result. The distemper in question is usually known by the vague name of "paard-sikte; and, as the cause is totally unknown, no remedy has yet been found efficient

to stop it. Throughout Great Namaqua Land it is particularly fatal. Some people attribute this singular disease to poisonous herbs, of which the animals have inadvertently partaken; others to the dew; and others again to the eating the young grass; but all the suppositions are highly improbable, for reasons which it would be unnecessary to enter into here. Fatal as the disease is to horses, yet happily there are places (even in districts where it commits the greatest ravages) that are always exempt from it. And as these localities are well known to the natives, if one's horse be sent to them prior to the commencement of the sickly season—usually the months of November and December—the animals invariably escape the malady. The attack of our animals was an unusual exception to this rule, for they fell victims to the disease fully a month prior to the rainy season. From the Orange River, on the south, and as far north as Europeans have penetrated from the Cape side, this deadly disease is known to prevail, and is one of the greatest drawbacks to successful travelling in South Africa. . . . Within Zwartbeoi's territory (Namaqua Land) was a mountain, called Tana, where horses might pasture throughout the year without being exposed to the paard-ziekte, the cruel distemper to which these animals are subject. Almost all the Northern Namaquas, Jonker among the rest, are in the habit of sending their horses here during the sickly season.'

"Having thus shown that the malady is no novelty, recent experience in Abyssinia having only demonstrated that it has a wider range than we were before aware of, the most important consideration is its prevention. Medical treatment, especially bleeding to syncope, is not to be thought of; prophylactic measures only should be studied in a campaign. There can be no doubt that exposure to the night air, without any covering or shelter, is one of the chief, if not the sole, cause of this malady. At the Cape it has been discovered that comfortable stables are an almost certain preventive; but it is very unlikely that this safeguard can be adopted at Annesley Bay. Knowing, however, that a certain degree of altitude insures solipedes against its attacks, and that ruminants are unaffected by it, it becomes at once apparent that if the mules and horses can be hurried off to the higher lands without a night's delay, if possible, on the low tracts, they incur but little risk afterwards. On the plain, where it has proved so deadly, bullocks and oxen (of which there appears to be no scarcity in the country) should only be employed as transport animals. It will be proved, I feel certain, that this horse-sickness is unknown in the highlands of

Abyssinia, the outbreaks which are now occurring there being due solely to the previous exposure immediately after landing. Every horse and mule should therefore be quickly removed beyond the region haunted by this pestilence, and their services there performed by oxen."—*Evening Standard*, January 24th, 1848.

ON THE STUDY OF BOTANY IN CONNECTION WITH PHARMACY.

(Extracts from an Address delivered by Professor BENTLEY, F.L.S., &c., at the British Pharmaceutical Conference Meeting at Dundee, 1867.)

"All experienced teachers of natural science must now admit that the study of nature is eminently calculated to impart tone and vigour to the mind and to elevate the general character, and should, therefore, be made, in all cases, an important part of a liberal education. Professor Balfour has well summed up its advantages, in these respects, by saying that 'It exerts a most beneficial influence on the observant faculties; it calls the perceptive powers into action; it teaches the student to note the resemblances and differences among objects; it promotes the formation of orderly and systematic habits: and it enforces accuracy, both of observation and of expression. It also benefits the mind by investing the objects around us with a new interest, and it supplies healthy and cheerful occupation at all times.'

"The advantages of the study of natural history in leading the mind to observe correctly and to discriminate accurately, have been so admirably and so tersely described by one who was my great teacher in botany—the late eminent and lamented Professor Edward Forbes—that I cannot do better than quote his own words. Speaking of the two qualities, *correct observation* and *accurate discrimination*, he says:—'The *first* depends mainly on the power of seizing all the features of an object or case with clearness and facility, detecting adventitious characters at sight, and excluding such from all influence on our conclusions. The *second* implies powers of just comparison, of perceiving the mutual relations of parts or facts, and of testing the possible agreement of statements with the circumstances which accompany them. Now, though all men are endowed with the elements of these quali-

ties, all are not born correct observers or accurate discriminators. Men must be therefore educated into such. The mind must be trained to reason justly, the instruments of the mind to observe correctly. The classical and mathematical studies of our youth are not intended merely to teach classics and mathematics, but to train us to the business of life, and to right judgment in the higher pursuits of men. The bodily exercises of our youth have not for their object merely those pleasures which such exercises afford, but the strengthening of our physical powers in order to ensure us a healthy and vigorous manhood. The training of the mind makes the intellectual mind, the training of the body the physical man. The end is gained in both cases by means essentially distinct from that end." He then proceeds to show that the study of natural history should be regarded in a similar light, as follows:

"'The first lesson of natural history is *observation*. The study of a vegetable or animal species is the perfection of observation, as far as that species is concerned. The form, the substance, the qualities, the phenomena of existence, the influence of surrounding objects, are all observed with the greatest precision, and defined so as to be capable of expression in words. No point affecting that species is left untouched. The study of a group or genus of vegetables or animals is in like manner the perfection of discrimination. All the members of the group are compared in all their parts with each other, the relations which they have in common are summed up, and their differences recorded in every possible point of view. The causes of those relations and differences are anxiously inquired into, and a survey is taken of the bearings of the whole group to its proximate allies; and, finally, to all equivalent assemblages in organized nature.'

"No one could go through such a course of study without having his mind improved in tone and vigour, for by such an exercise it must gain in both its analytic and synthetic powers.

"While the study of botany as a branch of natural history may be thus shown to be admirably calculated to train the young student to correct observation and accurate discrimination, qualities of the very highest importance to all scientific men, its value in promoting orderly and systematic habits, so essential to business men, must not be lost sight of. Thus, what can be better adapted for these purposes than the preserving and arranging plants in the formation of an herbarium? The care required in collecting, preparing, drying,

and preserving the required specimens; the neatness necessary to secure them on the papers on which they are placed, and to affix suitable labels; and the orderly and systematic manner in which they have, lastly, to be grouped together into genera, sub-classes, classes, and other assemblages, cannot but be eminently useful in such respects.

"Having now briefly alluded to the advantages to be derived from the study of such branches of natural history as botany in training the mind to observe correctly, discriminate accurately, and to acquire orderly and systematic habits, I cannot conclude this portion of my subject without indulging a fervent hope that the time is not far distant when such studies will become an essential part of the education of our youth. In saying thus much, I have no desire to discountenance, in any, way the study of the classics: for the youth destined for the pursuit of pharmacy must acquire a certain amount of knowledge of Latin and Greek, in order that he may understand rightly the prescription and directions of the physician, and the derivation and accurate meaning of the technical language necessarily employed in the sciences with which he must become acquainted. He ought, however, at the same time, to have some opportunity afforded to him of acquiring a knowledge of natural science, which would not only assist in training the youthful mind to thought and observation, but would have so useful a bearing on his future profession. The effect of such studies on the Continent, where science forms an important part of the education of youth, is abundantly evident; and already, in some of our great public schools, such as Harrow, Rugby, and Marlborough, some attention is given to science; and I cannot believe that the time can be far distant, in a country like our own, which owes so material a part of its prosperity to a knowledge of science, and peopled as it is so largely by men of practical minds, before the study of natural science will be considered as at least as necessary in the education of our youth as that of the classics.

"Another great advantage which the pharmaceutist will derive from taking up the study of a natural science is that which all must experience by the combination of scientific with the more purely practical studies of their profession, for nothing can be more injurious to the healthy action of the mind than to confine it entirely to some monotonous occupation; and nothing, on the other hand, can be more favourable to the development of its higher faculties and nobler aspirations than to turn, if only for the brief periods of relaxation which the necessary labours and cares of the world

may leave unoccupied, to the contemplation of the works of the Great Author of the universe.

"Formerly it was the custom to depreciate the value of the study of all the sciences as a branch of the education of the pharmaceutist, and he was recommended to confine his attention entirely to the practical parts of his business—a profession it could not then be called; but, thanks to the liberal and enlightened founders and subsequent supporters of the Pharmaceutical Society, as well as to the gradual progress of knowledge among all classes of the community, much has been done to drive away this degrading idea, and we may now fairly look forward to the time when an unscientific pharmaceutist will no longer be found.

"We now proceed to treat of the advantages to be derived from the study of botany as a recreation from the arduous duties of your profession. Recreation! I think I hear the hard-worked and too closely confined pharmaceutist exclaim, pray what time have I for recreation? But surely there are but few, if any, who do not have certain periods of relaxation; and to such what study is capable of affording so much that is pleasing and invigorating as that of botany? Who is there that is not attracted by the sight of a beautiful flower? And if the mere sight of a beautiful plant is thus calculated to excite our attention and to please our senses, how much more will it do so if we examine its marvellous structure, study its functions, learn its history, and ascertain the part it plays in the grand scale of creation! Is not such a pursuit eminently calculated to prove a recreation at once agreeable and purifying to our natures? And such a study is within the reach of us all, although in varying degrees. Thus the pharmaceutist, whose business is fixed even in the densest parts of our crowded cities, will find much to interest him, for it has been truly said that, 'however much the sun may be obscured from your abode, still some forms of vegetable life will be put forth; and though by comparison the rose or the lily may superlatively excel chickweed or groundsel, yet there is no plant, however insignificant, however common, which has not its own peculiar beauties and charms, and which would not be esteemed as a marvel of design, if others more beautiful were absent from the comparison.' But the opportunities afforded to the pharmaceutist will be increased a hundredfold when residing in or when his vacations lead him into the country, 'for the study of botany can nowhere be so well prosecuted as when remote from cities and the busy haunts of men.' To the country pharmaceutist, therefore, the advantages to be derived from its study as a recrea-

tion are more manifest, for to him the stores of nature are fully exposed, for in no season of the year will he be unable to pursue it; for there is none in which he will not be able to find something worthy of his attention; for each brings with it its own particular plants. Thus in the winter months and early spring many cryptogamic plants are in full maturity. As the spring advances he will find plants coming into flower of exquisite beauty and delicious odour, 'sweet harbingers of the approaching summer,' as well as others, which although frequently insignificant in appearance, yet will in after seasons yield fruits of great service to all. As the summer advances he will see vegetation in all its luxuriance, and as month succeeds to month he will find each developing its respective beauties, and thus affording him a ceaseless source of study and gratification. As autumn succeeds to summer he will see again new races of plants springing into flower, whilst at the same time those of the preceding seasons have now matured their fruits, which are frequently of inestimable value to man. No season of the year, therefore, is without its interest to the botanist. He who takes up the study of botany as a recreation has to wait for no particular periods, as the 12th of August, the 1st of September, or the 1st of October, to pursue it; but he will find that each month brings with it its own peculiar pleasures.

"Whilst the pursuit of botany may be thus shown to be a most agreeable recreation, it is, at the same time, a most healthful one, leading us, as it does, into the fields and gardens to breathe the pure air of heaven, removing us at the same time from all those contaminating pursuits which weaken the body and debase the mind, giving, also, an increased interest to our walks and rides, and furnishing us with a series of most agreeable associations. What associations can exceed in interest those of the botanist, who, when in turning over his collections in future years, and referring to a specimen, the sight immediately recalls to him the time and place in which it was collected, the friend who then accompanied him, probably the very subjects upon which they were conversing when that specimen was collected? and his thoughts will then especially wander to that friend, his many good qualities, the agreeable hours spent in his company; in fact, everything of interest relating to him will pass in succession through his memory. What friendships can exceed those thus formed by kindred spirits? And thus we find that the friendships of naturalists generally last throughout life.

"The pursuit of botany being thus shown to be most agree-

able and healthful, it can but be of essential value to those who, whether in the decline of life, or when the powers of the mind and the body have been overworked by a too laborious professional life, require an entire relaxation. There is no one that can appreciate its importance as a healthful recreation more than myself, for I originally commenced the study of botany as a recreation and for the pursuit of health, when both my bodily and mental powers had been weakened by a too laborious application to in-door pursuits. By its study I was led into the fields, where I speedily regained my health, and at the same time formed associations and friendships, some of which have lasted ever since, and to which I look back as among the brightest in my life.

"The study of botany being thus eminently calculated to prove an agreeable and healthful recreation to the pharmaceutist, I cannot but urge upon the young student of pharmacy the importance of its study during his pupilage, in order that he may then acquire that knowledge of its details and technicalities which will enable him hereafter to pursue and enjoy it as a recreation.

"Independently of the value of botany as a healthful and agreeable recreation, there is an innate gratification, a peculiar pleasure, which all men with properly regulated minds must feel when contemplating and studying the most beautiful of God's works, for 'even Solomon in all his glory was not arrayed like one of these.' Perhaps there is no study that is better adapted than that of botany for such a purpose; for the objects of which it treats are constantly before us, and their study is, therefore, within the reach of all. We can contemplate their beauty, study their structure, investigate the laws by which they are enabled to live, grow, and propagate themselves; see how admirably adapted they are to meet the varying conditions under which they are placed, and learn the mutual interchanges which take place between them and the inorganic world, on the one hand, and the animal creation on the other. None but those of the most depraved minds could derive anything from such a study as this but that which was pure and lovely.

"And, lastly, while thus dwelling upon the advantages and pleasures to be derived from the study of botany, I must not forget to say a few words as to its influence in purifying the faculties of the mind, and elevating our thoughts from the evidences of design thus brought before us to Him who designed them all. When we regard any beautiful object or clever design of human origin, do not our thoughts commonly wander from the object to the designer, whom we

shall hereafter think of as one to be admired and honoured? And if such be our thoughts in thus contemplating the works of man, how much more will it be the case if those works are of Divine origin! Thus when we see a plant with its wonderful structure and exquisite beauty, learn how admirably it is adapted to the conditions under which it is placed, and the influence it exerts in creation, what man is there, with a properly regulated mind, but must rise from such a study with a feeling of reverence for Him who designed it? and he will naturally be induced to ask, whether He, who thus formed the plants of the fields, and enabled them to perform such an important part in the universe will be unmindful of him—His noblest work—a being endowed with a soul, and adapted for a higher state of existence? With such thoughts, could he do otherwise than endeavour to discharge his duties in this world, that he might look forward with full assurance to a brighter and a happier existence hereafter."

GASES FOUND IN PLANTS.

Messrs. Faivre and Dupré have recently examined the gases found in the mulberry and vine, the parts which contain them, and the changes produced in them by the process of growth and development. They have arrived at the following conclusions :—1. The presence of gases in the interior of the root of the stem, and of the branches in the mulberry and vine, is a normal and constant fact. 2. The composition of these gases changes with the epochs of vegetation. 3. During the period of inactivity, carbonic acid is in very small proportion, and is scarcely appreciable. Oxygen is present to the same extent as in atmospheric air. During the phase of activity the contrary takes place, and the changes are more marked in proportion as the vegetation is more energetic; with the progress of vegetation, the proportion of oxygen diminishes. 4. In the roots, during the epoch of vegetation, the quantity of oxygen is not so great, while that of carbonic acid is greater than in the branches examined under the same circumstances. 5. In the branches, as in the roots, there is an inverse relation between the oxygen and the carbonic acid; by adding to the normal oxygen that disengaged under the form of carbonic acid, we obtain a number which is scarcely above the proportion of oxygen in the air.

6. In the mulberry and the vine, injections do not penetrate the pith or the bark, whether in the branches or roots. The ligneous layers are alone permeable to mercury. The more the formation of vessels increases, the easier and more complete are the injections. The injections are fuller in the roots than in the branches; they are also more in the branches than in the young herbaceous shoots. In the old stems of the mulberry, the central layers cease to be permeable. 7. Microscopic examination proves that the injection specially penetrates the pitted and reticulated vessels, and also the spiral vessels in the young herbaceous shoots. 8. The pitted vessels show distinctly the mercury in the areolæ, as if in so many little pouches formed by thin portions of the wall; the same observations have been made in regard to the reticulated vessels. 9. The contents of the vessels expelled by the mercury are variable. Sometimes gas only is sent out: this is the case in winter and after dry weather. Sometimes the gas is mixed with sap, which is more or less abundant according to the epoch of vegetation and external temperature. These two latter conditions regulate, in a certain degree, the contents of the vessels. 10. The contents are so variable that in plants the root-vessels of which contain gases and sap, the stem-vessels contain only gases, or inversely. 11. The presence in the vessels of animals of oxygen and carbonic acid mixed with the blood, constitutes one of the best established facts in animal physiology: the presence of the same gases mixed with the sap in the vessels of plants, and the modifications which they there undergo, seem to establish an interesting correspondence between these two kingdoms. —*Botanical Society of Edinburgh.*

YORKSHIRE VETERINARY MEDICAL SOCIETY.

The annual meeting was held at the Queen's Hotel, Leeds, on Friday, the 24th of January.

The President, Mr. Charles Secker, in the chair.

There were also present:—Mr. William Field, jun., President R.C.V.S., London; Professor Williams and Dr. Dalzell, of the Veterinary College, Edinburgh; Mr. Dawson, 14th Hussars; Mr. Owles, 6th Dragoons; Messrs. T. Greaves and P. Taylor, Manchester; A. Lawson, Bolton; Howell, Rochdale; McTaggart, Halifax; Carter and Walker, Bradford; Naylor and Fallding, Wakefield; Kirk, Huddersfield; Patterson, Dewsbury; Schofield, Pontefract; Anderton, Skipton; Pratt, Masham; Edmundson Harmby; G. Smith, Darton; Nicholson, Womersley; Bale, Otley; Taylor, Wetherby; James Freeman, Hull; Joseph Freeman, Keyingham; E. C. Dray, Cuthbert, Broughton, and Fearnley, Leeds.

Letters of apology for non-attendance were received from Messrs. W. Elam, Brighouse; Lord, Halifax; Thomas Secker, Ripon; John Freeman, Hull; Horne and B. Smith, Barnsley; and Fryer, Fleetham.

The minutes of the previous meeting were read and confirmed.

Professor Williams protested against the motion which was passed relative to the Scotch charter, as due notice of the intended motion had not been sent to all the members.

Mr. Broughton proposed and *Mr. Dray* seconded the election of Mr. Peter Walker, of Bradford, as a member of the Society. Carried.

Mr. George Bourdass, of Bridlington, was nominated as a member.

Mr. Dray moved and *Mr. Nicholson* seconded the alteration of Rule 3, as follows:

"That instead of the annual subscription being 21*s.*, as heretofore, the subscription for the *first* year be 21*s.*, and afterwards the annual subscription to be 10*s.* 6*d.*, due January 1st."—Carried.

Mr. Greaves moved, and *Mr. Kirk* seconded—

"That a donation from the Society's funds be given to the Fund of the National Veterinary Benevolent Society."

Mr. Dray much regretted being compelled to differ with Mr. Greaves upon this motion; and whilst fully recognising Mr. Greaves' excellent motives, he contended that the funds of the Society were not available for the purpose, and concluded by moving an amendment, "That no donation be granted."—The amendment, being duly seconded, was carried.

Mr. Naylor gave notice that at the next meeting he should move that a grant of the Society's funds be made to alleviate the wants of the two daughters of a deceased member of the College.

Mr. Dray moved and *Mr. Naylor* seconded the election of Professor Williams as an honorary member of the Society.—Carried.

The Professor replied, thanking the members for the honour conferred on him, and stating he felt that the fact of his being the first honorary member elected by this society was a great compliment indeed paid to him.

The President then delivered the inaugural address, in which he stated how deeply he felt the responsibility attached to the honorable position of being elected to preside over the Society during the current year, and his determination to use his most strenuous and vigorous efforts to carry out the duties of his office in the same exemplary manner that his predecessors had done. He paid a just tribute of praise to the former Presidents for their untiring zeal and assiduity in conducting the general business and increasing the welfare of the Society; thus aiding to advance the best interests of the profession at large. He strongly recommended veterinary surgeons to observe a strict gentlemanly bearing towards each other, as well as to all persons with whom they mixed, as thereby they would gain respect in the eyes of their fellow-men, and raise the *status* of our vocation. He also hoped and believed that he should have the mutual forbearance, as well as the cordial co-operation of every member of the Society; whilst he endeavoured faithfully to discharge his official duties he trusted in an efficient and satisfactory manner.

A vote of thanks to the President for his address was carried with applause.

The company then adjourned to a sumptuous dinner. The usual loyal toasts were drunk with enthusiasm, and then followed several toasts of a professional character, which were fully descanted upon by the various gentlemen who spoke in connection with the various subjects. The evening was spent in a most agreeable manner, and all departed home, having fully enjoyed the "feast of reason and the flow of soul."

The next meeting of the society will be held at Barnsley, in April, when Mr. P. Walker, of Bradford, will introduce a paper for discussion.

WM. BROUGHTON, *Hon. Sec.*

WEST OF ENGLAND VETERINARY MEDICAL ASSOCIATION.

THE regular meeting of this Association was held at the Greyhound Hotel, Bristol, on Friday, the 7th of February, when the following gentlemen were present:

Mr. T. D. Gregory, President, in the chair. Mr. T. D. Broad occupied the vice-chair.

Mr. J. Cornelius, Mr. Bibby, Mr. J. James, Mr. Sydney James, Mr. J. M. Broad, Mr. C. W. Gregory, Mr. House, Mr. Blake, Mr. Evans, Mr. Dring, Mr. Bland, and R. H. Dyer, the Hon. Sec.

The minutes of the meeting held at Bideford were read and confirmed.

The President made some observations respecting the movement which has taken place in reference to a Scotch charter. He reminded the members that a resolution was passed at the last meeting to the effect that the Council of the Royal College of Veterinary Surgeons were about to deal with the question, and that it should be left in their hands.

Several members advocated the presentation of a memorial to the Board of Trade, which was agreed to after some discussion, the Secretary being instructed to draw up a petition, which will be duly signed and forwarded at an early date. The former resolution was, therefore, rescinded, on the motion of Mr. J. M. Broad, seconded by Mr. Dring.

It was suggested by one of the members that Mr. Broad should make known the feelings of the meeting when sitting in Council of the Royal College of Veterinary Surgeons.

Mr. Bland handed in the following resolution:

"That a memorial be presented to the Board of Trade by the West of England Veterinary Medical Association, to the effect that no charter be granted to Scotland; and that the charter already granted to the Royal College of Veterinary Surgeons shall be the only charter for the United Kingdom.

Mr. C. W. Gregory seconded the motion, and it passed unanimously.

Mr. Bland also gave notice of the following motion—"That the by-laws be revised and corrected at the next meeting."

Messrs. John Evans, of Wells; Pring, of Bristol; and Sydney James, of Frome, were elected members.

Mr. Strange, of Bath, was invited to exhibit a dumb jockey, which he has been in the habit of employing for some years. It is very much like the "Surfaix cavalier," invented by Madame Isabelle. The differences are few and unimportant. There is, however, some merit in it, and its cheapness will recommend it to persons breaking their own colts.

Mr. Dring's paper was then read by the author. It proved to be on "Homœopathy," although the title given to it is "The Progress of Medicine." Mr. T. D. Broad, Mr. C. W. Gregory, Mr. Cornelius, Mr. Bland, Mr. James Broad, the President, and the Secretary, severally took part in the discussion which followed. The essay, not referring in an especial manner to our patients, did not awaken that amount of interest it would otherwise have done. It, however, brought out one important fact, which is that homœopathists do not pledge themselves *always* to the use of infinitesimal doses of medicine; indeed, some go so far as to recommend *substantial* doses of tincture of opium to be given, and also of other drugs.

The President was anxious to make it understood that the members assembled did not hold the opinions of the author of the essay.

A vote of thanks was accorded to Mr. Dring for his paper.

Those present afterwards sat down to a substantial dinner at the hotel, after which the usual loyal and professional toasts were given and duly responded to.

The members retired before 8 o'clock.

R. H. DYER, *Hon. Sec.*

NORTH OF ENGLAND VETERINARY MEDICAL ASSOCIATION.

THE seventeenth quarterly meeting of the above Association was held at Mr. Donald's, Crown and Thistle Hotel, on Friday, January 24th, 1868, at 2 o'clock in the afternoon.

The members present were:—Messrs. C. Hunting (President), R. Bryden, John Meikle, A. Mann, jun., C. Stephenson, D. Dudgeon, Thomas Plews, Matthew Hedley, John Gofton, Robert Hall, and the Hon. Sec.

The minutes of the preceding meeting were read and confirmed.

Letters were read by the Hon. Sec. from Professor Armatage and Messrs. Foreman, Blackhill, Peele, Hartlepool; and Marshall, Glanton, regretting their inability to attend.

The Treasurer read his annual report, and stated the funds of the Association to be in a healthy condition.

The President then read his inaugural address, which was well received, and followed by a spirited discussion, in which many of the members took part.

Mr. Dudgeon proposed a cordial vote of thanks to the President for his very able address. Seconded by *Mr. Plews*, and carried unanimously.

It was proposed by *Mr. Gofton*, and seconded by *Mr. Hedley*—"That the President's address be sent for insertion in the *Veterinarian*.—Carried unanimously.

Mr. R. Hall consented to read a paper at the next meeting.

The members and a few friends afterwards sat down to a sumptuous repast provided by Mr. Donald, and spent a very pleasant evening.

HENRY HUNTER, *Hon. Sec.*

INAUGURAL ADDRESS.

By Mr. C. HUNTING, President of the North of England Veterinary Medical Association.

GENTLEMEN,—Within the last two or three years great and important events to the veterinary profession have arisen. Foremost

amongst these stands the cattle plague question, which has done more than anything else during our past history to bring the profession before the notice of the whole country. All its proceedings in regard to that subject during the last three years have been freely discussed and criticised by the press; and although we were unsparingly handled at first by a large portion of the "fourth estate," yet, in the end, most, if not all, have done us the justice to acknowledge that had the advice of the profession been acted upon, many millions of money would have been saved to the country, and an incalculable amount of inconvenience to the general public prevented. We have reason, therefore, I think, to be satisfied with the position taken by us in this great and perplexing question. Infinitely more so than the members of the medical profession, who, as a body, took the most shallow views, offered the most ridiculous advice, promulgated old exploded theories as new, and acted upon them as sensible men would have done upon facts proven, gulled the whole country into a month's inactivity by which 300,000 to 400,000 head of cattle were lost, and mulcted the poor farmers out of from £30,000 to £40,000 in fees by performing nonsensical operations upon the poor bovine race. We have reason to feel thankful that no such gross blunder was made by the veterinary profession.

No member in our ranks can feel more grateful to the sister profession of medicine than I do for the liberal hand she has in past years held out to us. The most honorable names upon her lists are those who have taken a deep interest in the welfare and progress of veterinary science. Cooper and Liston, Sharpey and Bigbie, are names which can never be mentioned by us but with respect and esteem; but the spiteful nonsense contained in letters of M.D.'s, "culled" during twelve months from the *Times*, shows very clearly how slightly we are valued by the majority of the "faculty;" and if we intend to keep our ground, we must lose no time in making much more progress than we have done of late.

In two important points the cattle plague has been of the greatest possible advantage to us, and it has accomplished what a no less calamity would have done, viz., settled the question of the value of restrictive laws in preventing the spread of two diseases, which for years were the dread of the agriculturists and dairymen, viz., pleuro-pneumonia and epizootic aptha. For the last fifteen years, in a district abounding in dairy cows, from the "Tees to the Wear," fully twenty-five miles in extent, I believe neither of these diseases has ever been absent; and I am convinced that 100 animals have died from "lung-disease" for every one of cattle plague in that district, notwithstanding that the latter disease broke out in not less than twelve different centres. The losses of the dairymen were little less from the "foot-and-mouth disease" than from "lung-disease." In the latter they lost the animals, in the former they lost the milk and the flesh—nearly equal to the value of the cow. Well, how has it fared in this wide district under restrictive laws? Why, I may tell you that during the years 1866 and 1867 I have never seen or heard of a case, and we have a great many of the largest dairies under

contract, so that we should be certain to know if they existed. I have given you the result of my own experience in the value of preventive measures in a purely agricultural and mining district; and I find from close inquiry that equally beneficial results have followed in our large towns, and in none is it more clearly seen than in Newcastle-upon-Tyne. From our professional friends in this town I learn that they have been quite clear of these diseases, and in reading the correspondence of Messrs. Wilkinson, Stephenson, and others, on the "Cowkeepers' Fund," I observe that the number of skins, from animals dying of cattle plague since the outbreak in 1865 was 472, or equal to *half the losses of one dairyman in this town from lung-disease*. Mr. Race told me, in 1865, when experimenting on some of his animals, that he had lost upwards of 900 cows from pleuro-pneumonia, since the outbreak of that disease in 1842: yet his byers were as well arranged, as well as ventilated and kept as clean as any I ever saw.

I have dwelt long, but I trust not too long, upon this important subject. I have done so for two reasons—first, because it is a question that cannot be left where it is; for if the veterinary profession does not take action on such a subject somebody else will, and we shall be placed where all idlers invariably are—at the bottom of the class. Secondly, because I am pleased that there was *one* man in the country who for years wrote and taught precisely what the cattle plague has proved, and that man a professor of veterinary medicine, whose doctrines were scouted by a clique of ignorant farmers, butchers, and salesmen, and, shall I say it, by members of our own profession, who ought to have been above such "dirty" proceedings.

The next question of importance is that of "veterinary education"—a subject I should gladly pass over if I could, because I feel how very inadequate I am to grasp this vital question in so broad and comprehensive a manner as it should be, and as it *must be shortly*, or it will prove the rock that will shatter our vessel into many pieces. But however difficult the subject, and incompetent I may feel myself to discuss it, I feel strongly that such meetings as the present are the legitimate spheres where veterinary politics should be discussed, and are the only places whence the *real* feelings of the great majority of our profession can be obtained. I believe the disgraceful manner in which young men are sent out from our colleges into the provinces to practise the veterinary art is the great stumbling-block of the profession—a parallel case to which cannot be found in any other profession or trade in the kingdom. What is it our schools are doing? Why, they pretend to teach our young men all that is necessary to make them competent veterinary surgeons, whilst they themselves know that it is practicably impossible. No man, however industrious or earnest he is, can render himself fit to practice the veterinary art, at any of the teaching schools in Britain, in the time usually passed at College. I doubt if there is one third of the total number of students granted the diploma of the corporate body who are really efficient men, or who are practically acquainted with the science. Very many of them never per-

formed an operation on either horse, ox, or dog, in their lives, and not a few have never treated a case of disease. How is it possible that those who have never been in practice, or with a professional man, can have experience? At College they have no opportunity of either performing operations or treating cases. They have to gather this afterwards at the expense of their clients. Often they have been told they are competent to practice, and the result of this deception is ruin to a great number of young veterinarians, and thus the profession is depreciated by the public. In this practical age it cannot be otherwise, when every man is measured and weighed by what he *does*, more than by what he *says*. This system cannot go on. So long as it is a fact that young men from every class of society can enter our teaching schools, and after two sessions of "reading up" the theories of the day, and dissecting half a dozen subjects, are allowed to present themselves before our examiners without a tittle of evidence that they have treated a single case of disease or performed even the most simple operation, and then can obtain a diploma by standing the test of one hour's verbal answering—so long as this course is pursued we shall never make any marked progress in the estimation of the public. Most of us start with a lie in our mouths. We get a piece of parchment which tells us and the people whom we serve a gross untruth. A young man who has never seen a week's practice in his life, who is such a novice in all relating to horses that his manner of approaching one is a subject of amusement to the groom, goes into practice; the certain consequence is a lowering of himself and his profession in the eyes of the public. All are agreed that it is quite impossible for a man to thoroughly learn his profession at College. If he is not compelled to go with a practitioner, where is he to learn it? Why, he has to get it where I have already told you, and in so doing he too frequently disgraces himself and the profession to which he belongs.

Being one of those who believe that this state of things is anything but creditable, and if not soon altered will bring us into contempt among ordinary educated people, I have thought this a fitting opportunity to bring the matter before you, especially as the important question of education is now occupying the minds of most men, not only scholastic but technical; and we may rest assured that this great and vital question will end only in one way, viz., in the education of the whole nation; and when this shall come to pass, as it will within the next twenty years, woe be to the man who cannot give a reason for the faith that is in him, or ought to be in him.

In thus laying my mind open to you, I do not forget that I am treading on very debatable ground, and that it is very much easier to pull down a faulty structure than to build up a better; and from the present relative position of our teaching schools to the body corporate and to each other, no better building can be erected without a very large amount of forbearance, real earnestness, and an anxious desire for the advancement and future well-being of our profession.

Both the teachers of our schools and the Council of the corporate body, if any good is to be done, must work together in harmony; and whatever restrictions are put upon one school must be placed upon all, which can only be done effectually by mutual consent; and if either be more anxious to stick to dignity, prejudice, bigotry, or any other *non-essential*, more than its just rights, then it will be for the members of such associations as the one I have the honour to address to use their influence, wisely and justly, and to try to remove these and all other obstacles which retard the true interest and legitimate advancement of the veterinary profession.

In conclusion I shall briefly give you a rough sketch of what I should consider the *least* that should be done by way of testing those who are competent and who are not:

First. Before entering a veterinary school every one should be subjected to an examination as to his educational attainments, the subjects for such examination to be fixed upon by a committee chosen by the profession at the annual meeting, consisting of the Principals of all the duly authorised schools, and the President and Council of the body corporate; such examinations to cost only one guinea to the student.

Second. All candidates should be compelled to produce certificates of having attended *three* full sessions at one of the duly authorised veterinary schools, and also certificates of having been in active practice with a properly qualified man for at least fifteen months previous to going up for his final examination for the Diploma; this would be so far better than an apprenticeship, inasmuch as it would enable a student to go during each summer with two or three different qualified practitioners to gain his certificates of "practical knowledge," and would ensure the public against an incompetent man being palmed upon them; and it would also be a great means of preventing the miserable failures of so many of our young men when entering an active professional life.

Third. The examination for the diploma should be very much extended, and be both written and verbal, and should be divided into two parts. After the end of the second session, two years' students should be examined in anatomy and physiology, and at the final examination, at the end of the third session, only in chemistry, pathology, and botany; and this should consist of four hours' written and two hours' verbal examination.

Fourth. I would also iutroduce a class of "fellowships," to which should be attached certain privileges, say, £25 a year for two years. The examinations for these should be very high, embracing comparative anatomy and physiology, comparative pathology, microscopy, botany, analytical chemistry, and hygiene, and should be both written and verbal.

Such is a rough outline of what we should consider are some of the real wants of our profession. I would not make the preliminary examination of a very high standard, because it would shut out many good men; but I would have no mistake as to the final examination. No idler, no dissolute, no sentimental student, who

had wasted the half of his time, both at College and in practice, either in frivolity or dissipation, should have the shadow of a chance of passing the ordeal to which I would subject him for his diploma. The longer and more searching the examination is, the better for good men; yes, and for middling ones too; it is only the useless hypocrites that would fear the honest test, and the sooner these are weeded out the better for the profession, and the better, too, for the country at large.

Looking at the veterinary profession in an abstract point of view, there is no more difficult, no more complicated, no more important, no more useful science in the land; and it is most important that the fact should be known, that it does require a good education, and a full average share of common sense, and long experience, to make a man a competent veterinarian; and until this is known by the nation we shall never gain the national confidence and esteem.

Veterinary Jurisprudence.

In the Court for the consideration of Crown cases reserved, the following cases have been heard before the Lord Chief Justice Cockburn, Justices Keating, Shee, and Smith, and Mr. Baron Pigott:

THE QUEEN *v.* BULLOCK.

The prisoner was tried and convicted at the Gloucester general quarter sessions for maliciously and feloniously wounding a gelding, the property of James Rickets. The prisoner was sent by his master with a horse and cart to fetch stone from a distant field, and when he returned the horse's tongue was protruding seven or eight inches, and he was unable to draw it back into his mouth. The veterinary surgeon who examined the horse the following day, proved that he found the root and lower part of the tongue much lacerated, and the mouth torn and clogged with clotted blood; the injury, he thought, might have been done by a violent pull of the tongue on one side. Five inches of the tongue had to be amputated, and the horse was likely to recover. The prisoner's statement was that the horse bit at him, and he did it in a passion. There was no evidence to show that any instrument beyond the hands had been used. The prisoner's counsel contended that no instrument having been proved to be used in inflicting the injury, the prisoner could not be convicted under the 24th and 25th Vic., chap. 97, sec. 40. For the prosecution it was urged that under the statute it was not necessary to show that the injury had been caused by any instrument other than the hand or hands of the prisoner. The prisoner being found guilty, the chairman respited judgment, and reserved the point for the consideration of this Court, viz., whether the pri-

soner was properly convicted of wounding, there being no evidence to show that he used any instrument other than his hand or hands. The Court confirmed the conviction.

THE QUEEN *v.* ROBERT NUCKFORD.

The prisoner was indicted at the Warwick sessions for stealing fowls. A constable met the prisoner on the road about one in the morning. He threw down four dead fowls, which were warm and bleeding. He then ran away, but was traced through the snow to his house, where he was found undressed, and his wet clothes hanging near the fire. The prosecutor believed, from the appearance and breed of the fowls, that they were his; but as he had a great number of fowls he could not say whether any were missing. There were feathers on the prisoner's clothes, a mark of wet fowl-dung on the knee of his cord trousers, and marks of cobwebs on his hat. It was submitted, on the part of the prisoner on the trial, that there was no evidence that a larceny had been committed; there was no evidence that the prosecutor had lost any fowls; there must be some evidence that fowls had been stolen. These questions were left for this Court.

The Chief Justice said, supposing a man was seen going away from a barn where there was a quantity of corn, and the man had a sack of corn on his back, could it be said, because the prosecutor could not state that he had lost any corn, and could not swear to the identity of the corn, that the man could not be convicted of stealing the corn?—Conviction affirmed.

MARLBOROUGH STREET.

TRICKS OF HORSEDEALERS.

Henry Foreman and John Hibbert, general dealers, of York Street, London Road, were charged with obtaining the sum of £5 from Mr. Wilson, cab and omnibus proprietor, of Carlisle Street, Westminster Road, by means of fraud.

Mr. Abrams appeared on behalf of the Royal Society for the Prevention of Cruelty to Animals, by whom the prosecution was instituted; Mr. Edward Lewis, of Great Marlborough Street, appeared for the prisoners.

The charge against the the prisoners was one of a very curious character. They became possessed of a horse which they told Mr. Wilson they had brought up from Reading. After some parley the horse was tried, and the result being satisfactory, £5 was paid for the animal. After the lapse of a short time it was found that the horse was lame, and on an examination being made by a veterinary surgeon it was discovered that a hard substance had been inserted in the hoof of one foot, in order to hide permanent lameness in another.

An examination of the shoes proved conclusively that the animal could not have been driven from Reading; and Mr. Wilson having laid the facts before the Royal Society, the prosecution, which was for cruelty to the horse as well as fraud upon the purchaser, was instituted.

Both men were committed for trial, but bail allowed.

ARMY APPOINTMENTS.

War Office (*Gazette*).

To be Staff Veterinary Surgeons, India.—Veterinary Surgeon, First Class, R. J. G. Hurford, late of the 7th Dragoon Guards, Principal Veterinary Surgeon in Bengal; Veterinary Surgeon, First Class, W. Johnson, late of the 20th Hussars, Inspecting Veterinary Surgeon in Bengal.

Royal Regiment of Artillery.—The first commission as Veterinary Surgeon, First Class, J. Tatam, to be antedated to the 13th of October, 1855, the date of his appointment as Probationary Veterinary Surgeon.

OBITUARY.

It is with extreme regret we record the death, on the 10th February, after an illness of a fortnight only, of Mr. W. Litt, M.R.C.V.S., &c., aged 50. His diploma bears date March 31st, 1841. Our pages have often been enriched by his pen, and his paper on the "Law of Warranty," read at the Veterinary Congress, will ever be remembered by the profession, which has lost a distinguished member. We had known him long and possessed his friendship, which we esteemed. His poem on "Uriconium" he kindly sent to us. We liked it, and have made quotations from it. Why we have so long escaped the scythe of the ruthless destroyer, death, it is not for us to ask. "Our fathers, where are they?" This removal of one and another from among us tells us how transitory are all earthly things; but there is another and a better world beyond the skies—

> "Where everlasting spring abides,
> And never withering flowers."

We readily insert the following, kindly forwarded to us:—

"A wide-spread feeling of regret has been created in this town (Shrewsbury) and neighbourhood by the death, which took place on Monday night last, of Mr. William Litt, veterinary surgeon. The deceased gentleman held very high rank in the profession which he had adopted, and was the author of many able papers on subjects pertaining thereto. Few men possessed the capacity to state their views

in language at once so vigorous and graceful; and his opinions were generally sound. In the various agricultural papers, in the organ of the profession, *The Veterinarian*, and in the local journals, his communications were always set prominently forth, and invariably commanded much attention. He was the first publicly to suggest, through the columns of the *Chronicle*, the propriety of erecting a statue to the great Lord Clive; and among a lot of valuable papers read before the Wenlock Farmers' Club last year that furnished by him was pronounced to be the best, and to it was awarded a prize which the president of the club had given. As a poet, too, he had claims to notice; and although the majority of the adjudicators appear not to have thought so, the opinion was pretty general that his poem on Uriconium, sent in to compete for prizes offered, was infinitely better than either of the prize poems. As a literary man there can be no doubt he might have taken up a strong position had he chosen to devote himself exclusively to literature, and as a veterinarian it may fairly be said of him that he had few equals. He was ever ready to render assistance where anything thought to be calculated to benefit the working classes was mooted; and in the early days of the penny reading movement he did much towards its success in Shrewsbury. A man of great talent, of unswerving integrity, and goodness of heart, he was, and deserved to be, respected and beloved; and much earnest sympathy is felt for the numerous family he leaves behind, to whom his loss is irreparable. Mr. Litt was a native of Hensingham, Cumberland, but had resided in Shrewsbury for some years, having previously lived at Bishop's Castle, in this county; and he was in the full vigour of manhood when seized with the illness which terminated in his death. He will be succeeded in his practice by his eldest son, a young man of great ability, who is well known as a skilful practitioner, and has received several first-class medals for essays on veterinary subjects. There is no doubt, therefore, that he will receive encouragement."

We have to record the death of Mr. Joseph Laver, of Somerton; diploma dated December 15th, 1836. Mr. John Angle, of Tollington Park, London; diploma dated May 15th, 1857. Mr. John Harris, of Preston; diploma dated May 17th, 1828. Mr. George Houston, of Dalkeith; diploma dated April 24th, 1844. Mr. Andrew Edmonston, of Aberargie; diploma dated April, 1835. Mr. Mr. John Bissett, of Montrose, Forfarshire; diploma dated April 17th, 1834. Mr. Thomas A. Murray, of Parsonstown, Ireland; diploma dated April 27th, 1846. And also of Mr. William Ford, of Biggleswade, Beds; diploma dated February 4th, 1830. None of these deaths are, however, of very recent date, with the exception of the last named.

We have also to record the death of Mr. Richard Cortis, M.R.C.V.S., Shipton, York, which took place a few weeks since. His diploma bears date July 1st, 1824.

THE

VETERINARIAN.

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Communications and Cases.

THE PROPOSED VETERINARY CHARTER FOR SCOTLAND.

By Thos. Greaves, M.R.C.V.S., Manchester.

Since the publication of this month's *Veterinarian* I have received a number of letters from very eminent veterinary surgeons who are at the present time in practice on this, as well as from other veterinary surgeons who are in practice on the other side, of the Tweed, offering to espouse and support the movement, the object of which is to ensure a united profession, and if needs be, to justify and vindicate the course I have adopted for that purpose. Whilst thanking those gentlemen for their encouragement and fidelity, I feel persuaded that it is only necessary to make a few remarks, with a view to clear up any point which may have appeared ambiguous in my former letter, and which is so much complained of in a letter published in this month's *Veterinarian*, and signed by several veterinary surgeons who appear to be the leading spirits chiefly interested in the perpetuating of a disunited profession.

In the first place, I wish distinctly to disclaim all animus towards the Edinburgh Veterinary College; in proof of which I may say that several of my pupils have matriculated at that college, and even at the present time one of them is being educated there. I have always been particularly careful to avoid, if possible, wounding the susceptibilities of any of the Edinburgh partizans by always calling the

Edinburgh Veterinary College, a college, never a school, and the Highland and Agricultural Society's diploma, a diploma, never a certificate. The sentence to which objection is taken in the first paragraph of my letter is no fault of mine; I wrote "THE PROPOSED VETERINARY CHARTER,"—the alteration into "proposed veterinary school"* was made after it left my hands, and I felt mortified when I saw it so altered when in print. It must be self-evident to any unprejudiced person that it could neither refer to a school nor yet to a college, since there is no such institution proposed at the present time.

So much for complaint and enlightened interpretation of the first paragraph.

As to the second paragraph, the unfairness is obviously intentional, when the petition to Parliament is represented as an English metropolitan demonstration. It must be well known to the writers that the subscribers to that petition were assembled at the annual meeting of the profession, and were composed chiefly of practitioners from every province in England, many from Scotland and Ireland, and that numbers of them were graduates of the Edinburgh Veterinary College.

As to the third paragraph, it is nothing less than a distinct perversion of the truth. It ascribes to the Yorkshire Veterinary Medical Society the only three dissentients to the passing of the memorial, praying that a charter should not be granted to Scotland. I speak it to the honour of the Yorkshire Society that the motion was carried with perfect unanimity; not a breath, murmur, nor whisper of dissent was manifested (precisely the same result as took place at each of the other veterinary medical associations—the votes were regularly, deliberately, and legitimately given and recorded, only the one solitary instance when three only advocated disunion). When at the next meeting of the Yorkshire Society Professor Williams so vehemently protested against the decision, asking that body to stultify their vote by rescinding it, not a man could be found to second such a motion, which was deemed the height of bad taste, and an insult to the good sense of that body of gentlemen. The instance of the three dissentients which I alluded to was at another veterinary medical association altogether, such being a second meeting of that body convened by circular expressly to consider this question of memorialising Government not to grant a charter to Scotland. So much for the unfair and false statement that it was "unconstitutionally obtained."

The opponents of these views gathered in all their strength

* This typographical error was overlooked in the proof. No such change of words was made by us.—EDS.

from the east and west, from the north and south, and the whole question was fully and fairly discussed. Even the two professors from Edinburgh were present, appealing eloquently in long speeches, trying to prove to us an untenable paradox, that union is not strength, and to persuade us to become promoters of disunion; but after using every means in their power, they could only muster three votes. Who were those three dissentients — those promoters and perpetuators of disunion? Why, they were the men who, a few years ago, were the first to sign a memorial to Professor Dick, humbly but earnestly praying that he would discontinue his examining board, showing forth in language far stronger than this memorial of ours the evils of disunion. The said memorial, amongst other statements, sets forth "that they have long deplored that want of union in the veterinary profession; that the state of things may be materially smoothed down if not altogether removed by the adoption of the Edinburgh Veterinary College of the Board of Examiners appointed by the chartered college, and they entreated Professor Dick to enter into negociations at once with the council of the Royal College of Veterinary Surgeons for that purpose, concluding that your memorialists will not be doubted when they say that their prayers are for the best interests of both founder and institution." With this prayer every true man in the profession would accord. This said memorial was signed by upwards of seventy graduates of the Edinburgh College, and was headed by Mr. William Williams of Bradford. So much for the consistency, the fidelity to principle, the faithfulness to convictions, of these three distinguished men, and the erroneous statements of the subscribers to that letter.

The fourth paragraph is heralded in with such a flourish of trumpets that we are led to expect that I am to be annihilated at the next breath; but, lo and behold, it sums up with a distinction without a difference. I used the word "condemnation of the proposed charter," "none in favour of it as it now stands," when speaking of the object of the members of the West of Scotland Veterinary Medical Association at their interview with the Lord Provost. The subscribers to this letter say the objects of such members in the said interview were "adverse only to the charter, such as the draft then proposed intended to create." Surely, being adverse to the proposed charter, as then proposed, conveys pretty much the same meaning, if not the very same, as condemning the proposed charter as it now stands. I am of opinion with the general body of the profession that this is an

unfair and unnecessary straining of the case. The gratuitous statements about illogical and unfair inferences I do not deem worthy of notice, as my only intention is to give a clear and careful setting forth of facts. As regards the numbers of replies to my circular, and the specious arguments founded upon them, being at best the sheerest presumption, I will leave them in the hands of the profession to judge between us, and to form their own opinion. I may add, I had the same register to address each letter by as they had, and the noticeable fact must be observed that in my case one letter out of every five was returned (address not known), but in their case, according to their statement, only one letter in every ten were returned.

In conclusion, I think with many friends who have spoken and written to me upon the subject, that the accuracy of not one paragraph of mine has been refuted. There is a most unfair rendering of every paragraph, and inferences that were never dreamt of have been drawn. Not a vestige of argument or reason is advanced in the least calculated to throw light upon the question, and such a tone and line of argument never did gain an adherent to any cause; but when I see it so boastfully paraded that these subscribers are men who have the good of the profession sincerely at heart and no selfish ends to secure, the whole thing savours of and assumes some of the characters of a burlesque, at the same time I find one of the said subscribers to this letter is canvassing by circular, and strenuously importuning every governor, trustee, &c., of the proposed charter to promise him his vote to be elected the secretary to the intended chartered body. Talk of sophistry, there are men who can see through such coquetry, and who think and say the love of profession in such a case is subordinate to another and lower motive.

Taking the letter as a whole, it may, with perfect fairness, be said, that a weaker or a more unfair critique was never placed before the readers of the *Veterinarian* than is to be found in this memorable letter of seven subscribers.

CASE OF TRAUMATIC TETANUS, SUCCESSFULLY TREATED BY ACONITE AND HYDROCYANIC ACID.

By W. A. Wilson, M.R.C.V.S., Liverpool.

On the 16th of January in the present year I was called to visit a horse belonging to Mr. John Davis, farmer, of Childwall, near Liverpool. The messenger said "there was something wrong with the animal's mouth, as it could not feed."

I found the patient, an aged bay mare (a favourite animal of the owner's, and used for harness purposes only), in a state of great pain. The history of the case is as follows :—

Some ten days prior to my visit, the mare was sent to be be shod at a country smith's in the neighbourhood, and on its return home appeared to be all right. Three days afterwards she was required to make a journey of some considerable distance into the country, and was discovered to be lame on the off fore limb ; on the shoe being removed by the nearest smith in the place it was found that the foot had received a prick from one of the nails, and suppuration had taken place. The case was treated in the ordinary way, and after some days' rest, the animal seemed to have recovered from its lameness, and was driven home. During the three following days, however, the mare began to droop, and to experience a difficulty in swallowing. I was, therefore, sent for, and thus first saw the case ten days after the animal had received the injury.

The symptoms which presented themselves were as follows : —Complete rigidity of all the external muscles, the abdominal being strongly retracted ; nostrils painfully dilated ; eyes fixed, forehead drawn up into furrows, and the ears rigidly erect ; the head was protruded, and the tail projected outward in nearly a straight line from the body. The jaws were not quite closed, there being sufficient space to admit the finger ; she was sensitive to the slightest noise, and showed evident symptoms of fear on being approached, as if dreading to be touched. The membrana nictitans was partly protruded over the eye, and became completely so, on the slightest elevation of the head. The pulse, when she was at rest, stood at about 50, but, under excitement, both it and the breathing became considerably accelerated. The bowels were

constipated, urine scanty and high coloured, and micturition was evidently accomplished with much pain and difficulty. On removal of the shoe from the injured foot, I found traces of the injury, but the wound was quite healed.

I gave instructions for the mare to be removed as gently as possible into the darkest and quietest part of the stable, no loose box being at hand, and to be kept as warm and quiet as possible.

Ordered ten minims of Flemming's tinct. aconite to be given morning and evening in a pint of water, from a small-necked bottle, the head being slightly elevated.

17*th*.—Inflammatory symptoms increased; medicine repeated.

18*th*.—Finding that the action of giving the medicine greatly distressed her, and the symptoms increasing, I ordered ʒj of acid hydrocyanic dil. to be added to the aconite, and mixed twice a day in the pail of oatmeal and water that was kept constantly before her, and of which she partook pretty freely, considering the difficulty of deglutition. This treatment was continued for the next three days.

21*st*—Perceptible remission of symptoms; relaxation of the masseter and other muscles. The mare was now able to eat a little bran mash; the bowels also gave evidence of returning to their natural state. From this period up to the 9th of March, the date of my last visit, the above treatment was continued, and the mare gradually recovered, and I left my patient convalescent, lively and active, able to take her food as usual, and to lie down.

It is evident from the symptoms which I have described, that the case was one of traumatic tetanus, and that the cause of it was the prick which the animal received at the time of its being shod. One favourable feature was the entire absence throughout of complete trismus, as during the treatment of the case there was sufficient space between the teeth to admit of the animal taking its gruel and medicine by the mouth. I have in similar instances previously given the above medicines by injections per rectum, but never with the same results. Indeed, I think perfect quietness is one of the principal things to be attended to in this disease, and anything that tends to disturb the animal, as drenching, injections, &c., ought to be avoided. I have (ever since the commencement of my professional practice, now thirty years ago) been led to entertain a very high estimate of the sedative mode of treatment in cases of nervous disturbance, and the effects of the combination of hydrocyanic acid and aconite, which was given freely in this

instance, still further warrant me in adhering to that opinion.

I am further fortified in this conclusion, from having seen similar cases treated in an opposite manner, viz. by bleeding, blistering, purging, &c., and which cases terminated fatally.

As cases like the above are not of frequent occurrence, I thought it sufficiently interesting to occupy a space in the pages of your valuable journal. I may observe that Mr. Richard Reynolds, veterinary surgeon to the Corporation of Liverpool, saw the case with me once in its early stage, and was satisfied of its nature, and agreed with me as to the propriety of the treatment which I was adopting. Dr. Galloway, a medical friend of mine in this town, being anxious to watch the case for comparative purposes, also saw it in its early and latter stages, and satisfied himself of the analogy between human and equine traumatic tetanus, in respect to the similarity of symptoms and treatment.

ON TETANUS.

By Alfred J. Owles, York.

Some three or four years ago I read in your valuable journal an essay on tetanus, by, I think, Mr. Lawson, V.S., Manchester, who therein recommended the use of prussic acid in the treatment of that very painful and usually fatal disease. I was struck at that time by the large number of recoveries under Mr. Lawson's excellent system of treatment, and I resolved to adopt the same plan in the first case that came under my care; I never could understand the old system of blistering the spine and administering powerful purgatives, &c.; such irritating measures always appeared to me to be eminently calculated to do harm, by acting through the peripheral terminations of the sensitive nerves upon the centres, and by reflex action of the motor branches upon the muscles, thereby increasing the tetanic symptoms, and also intensifying that condition (polar) of nerve-tissue, upon which we believe these symptoms depend: we can prove the former in a tetanic subject by any description of irritation to the terminal branches of sensitive nerves, and also by acting upon the brain through the nerves of special sense, especially those of hearing. I once saw a tetanic patient in a profuse sweat, with the nostrils distended, the head stiff

and drawn back, and the membrana nictitans almost covering the eye; these distressing symptoms were produced by sounds; the subject of them was kept in a loose box, and orders were given that everything should be kept very quiet about him, as prussic acid was being tried upon the case; but unfortunately, in placing some boards against the rear of the box, a flapping noise was produced by carelessly dropping them down, and thus was caused the suffering to my poor patient that the above symptoms indicated. I quickly stopped the noise, and did all I could to pacify the poor animal, greatly fearing that all now might be in vain; but he gradually returned to his former state, and ultimately recovered. I have detailed this incident, because I firmly believe that the success of any treatment for tetanus depends more upon the absence of all cause of excitement, or irritation, either in the form of treatment, or from surrounding circumstances, than upon the medicine we administer.

I did not intend to write so long a preface, but simply, with your permission, to bear testimony to the success which we may expect from the use of prussic acid combined with perfect quietude, in cases of lockjaw. Since I read Mr. Lawson's paper, I have treated successfully two cases of tetanus, being all I have seen during the period. I feel that I am indebted to Mr. Lawson for a remedy at once simple, rational, and, as I believe, scientific also; and I would recommend it strongly to any one who may not have read, or heard, of Mr. Lawson's treatment, to whom I beg to offer my thanks. It is with peculiar satisfaction one sees nature conquering so painful a disease; twice I have enjoyed this feeling; and although to some it may not seem much gained, to stand by and watch nature combating and conquering almost single-handed: to me it appears a great matter that victory is with life, although we cannot claim any great share in the merit, still it is something if we do no *harm* by inappropriate remedies injudiciously administered, whereby the spasms are increased, which no doubt results in many cases from the too great meddling of attendants. Derangement of nervous tissue is in many cases only known by the effects. Nerve tissue shows no physical change during action, neither does it in tetanus or during the action of strychnine, but there is a striking resemblance in the effect produced by that poison to the spasm of the muscles in the former disease, and we may, I think, reasonably infer that the condition of the tissues is also similar; apropos of our subject I may remark, that I saw in the *Lancet* for February 22nd, an account of a dog which it was supposed had been

poisoned by strychnine: this dog, while suffering severely from spasm, &c., had prussic acid in poisonous doses administered to it, with the view of ending its sufferings; but, much to the astonishment of the attendants, the animal almost immediately began to improve, and quickly recovered, to the joy of all concerned.

I will not enter into the details of the cases of tetanus; suffice it to say, that the case alluded to above, occurred about three years ago in an aged gelding, which ran away and staked itself in the elbow, producing a lacerated wound, which did not heal kindly; the spasm of the muscles came on about five weeks after the injury was received, and while the wound was in process of healing, the patient, which presented the usual symptoms, was kept in a box, and one drachm of prussic acid was given to him night and morning in sloppy mashes, which he ate readily, although he could not move the jaws freely. After three weeks the spasms relaxed in some degree, and the dose of acid was reduced: in about six weeks the patient appeared quite well, and soon after went to work. The second case occurred recently in a hunter in good condition, which was lame in one foot for a few days only, from concussion: just as the heat and lameness had subsided, I observed, as the horse was being turned round in the stall, that he moved "all of a piece," and the membrana nictitans protruded nearly half over the eye; the jaws were partially fixed, the tail was held nearly straight out, and the muscles generally were hard and rigid, but the pulse, when the animal was quiet, was not much disturbed. This horse was also placed in a loose box, and treated in the same way as the previous case: he began to improve after a fortnight, and in three weeks the dose of acid was reduced one half. This horse is now free from all spasm of the muscles, although he has not returned to work at present, as he lost condition during his attack.

ON BROKEN WIND.

By James Anderson, M.R.C.V.S., Glasgow.

Case 1.—A small pony ten hands high, and aged, was bought by Ferrier Kerr, Esq., merchant, Glasgow, in the summer of 1866, for his children to ride. It performed its work well for several months at first, but at length it became quite incapable from distressed breathing and exhaustion.

I was requested to visit the pony by Mr. Kerr, on the 16th of May following, and I diagnosed it to be a case of "Broken Wind," from the following symptoms. While the animal was standing in the stall, the abdominal breathing was hurried, with a double effort made on expiration. On being taken out of the stable, and trotted for a very short distance, the abdominal breathing became more accelerated, and the double effort of expiration proportionately quickened.

The animal hung its head, and appeared very much distressed. I attributed the symptoms to disease in the lungs, and reported it as being a hopeless case. As I was very anxious to make a *post-mortem* examination of the animal I suggested to Mr. Kerr to have it removed to my father's yard, where I would destroy it, at a time when I could devote more attention to the autopsy.

Mr. Kerr at once consented to my desire, and the animal was handed over to me. I tried it with the late Professor Dick's favourite remedy for broken wind, viz, calomel, camphor, opium, digitalis, and gentian; besides I gave it repeatedly oleaginous laxatives, as the bowels were costive.

The medicines did no good. The animal died a week after. I made a *post-mortem* examination. The lungs were perfectly healthy. I particularly examined them, to ascertain if any rupture of air-cells had occurred, but no such thing existed. All the other organs of the body were normal, with the exception of the stomach, which was in the following state:

Great engorgement, causing extreme attenuation of its wall, and loss of its contractile power. The secretion of gastric fluid had, apparently, been suspended for some time before death, as the contents were kneaded, undigested hay, and mucus; the mucus, as it were, glued the hay fibres together. In fact it looked more like a bag packed solidly with clay than a stomach containing its natural food. The impacted contents seemed as if they had not been subjected to vermicular motion for days. On the surface of the food was a thick layer of mucus. The passage of communication between the œsophagus and duodenum I can only compare to a tube of the same diameter as the duodenum, and the floor of which, instead of being formed of mucous membrane like the duodenum, was formed of deposited mucus, the roof of the tube being represented as that portion of the stomach at its lesser curvature.

From the duodenum to the anus, nothing was to be seen but oil globules floating in gruel.

Case 2.—On the 11th of October last, I had the oppor-

tunity of making a *post-mortem* examination of a well-marked case of "broken-wind." It was of several years' standing. The animal belonged to the Earl of Glasgow. The animal showed the symptoms more while being subjected to stable treatment. At grass the symptoms were scarcely perceptible. In this case nothing abnormal was to be seen in the lungs.

Case 3.—November 18th, 1867, I was called to a well-marked case. The subject was a cart-horse, the property of the Wishaw Coal Company. The fireman, Mr. Bowie, said that he had been badly affected for at least two years. He was inclined to have him destroyed, but, as I was anxious to experiment upon him, I recommended that he should be kept. The symptoms were as bad as in the pony which belonged to Mr. Kerr.

In this case I attributed to impaction of the stomach, and administered medicines to empty it by slow degrees. I thought that if that was successfully accomplished, Nature would give it again a healthy tone. I therefore administered aloes in doses of two drachms, with camphor, half drachm; the balls were made of large size, with treacle, gentian, and ginger. I ordered him to get no hay, but plenty of gruel and linseed tea. Also a few raw potatoes several times a day. In less than a week a great improvement was observed in him under this treatment. Seeing he was progressing so fast I advised that he should get a little straw instead of hay to eat; and I also ordered oil and lime-water, equal parts, and to be mixed with bran and oats, to be given every day. I recommended little or no boiled food to be given him.

The other day Mr. Bowen informed me that the horse was in perfect health, and doing his work well.

Case 4.—On the 31st of September last I was called to another case which was considered hopeless. The animal was the property of Mr. Bining, Langside. I followed the same course of treatment with him as in the preceding case, and he soon recovered, and has kept well since. Mr. Bining hunted him a few days ago, and was well carried.

Seeing that the cases as described all had healthy lungs, it is, I think, sufficient to prove that "broken wind" is not always dependant upon ruptured air-cells. In fact I now doubt the theory of laceration of the air-cells, as the cause of broken wind. I cannot see how a rupture could take place to the extent that would be required to cause broken wind, without very much endangering the animal's life by setting up violent inflammation of the lungs. A very interesting but difficult question presents itself for solution with regard

to these cases, viz, What could be the cause of the "broken wind?" Could it have been produced from the impacted stomach causing mechanical obstruction to the movements of the diaphragm, and thereby require the abdominal muscles to make greater effort to assist expiration?

Could it have been produced from the undigested contents of the stomach pressing on and irritating the ultimate branches of the pneumo-gastric nerves, and, through sympathy, affect the lungs?

I wish that some who have been longer in the profession than I, and who may have seen cases of a similar nature, would give their opinions on the subject.

TRAUMATIC TETANUS.

By J. Horsburgh, M.R.C.V.S., Dalkeith.

From time to time, in the march of medicine and surgery, like other allied sciences, some expanded mind conceives some great and novel thought, destined in its practical application to ameliorate and promote the happiness of mankind; but almost as often as this humane intellect has been permitted to obtain any new light, or make any new discovery, human prejudices, passions, and ignorance have blazed forth in ungovernable passions, deny its truth, its utility, and asserted the very contrary as a fact; and thus the first advances as a friend to humanity or science are contested and battled as if he were an enemy.

When Lady Mary Wortley Montague introduced the practice of smallpox inoculation into England from the East, what a fearful and thankless enterprise was it to her. For four or five years immediately succeeding her arrival at home, she seldom passed a day without repenting of her patriotic undertakings; and she declared she would never have attempted it if she had foreseen the persecution, vexation, and obloquy that it brought upon her. The medical faculty rose against her to a man. The clergy denounced from their pulpits those who impiously were seeking to take out of the hands of Providence the dictates of the Almighty, and the common people were taught to hoot at her as an unnatural mother, who had risked the lives of her own offspring, whenever she dared to appear in the streets.

During the latter half of the last century, 30,000 individuals were supposed to die annually of smallpox; for fifty years

the mortality in England and Wales was reduced 20,000 a year. And for this triumph over this most troublesome and loathsome disease science stands indebted to Dr. Jenner. In 1842, 2715 died; formerly it was one in each 250 that died. It was thus reduced to one in each 1700, and every medical man must certainly be ready now to allow that this discovery is not the less remarkable in its amazing success than in consequence of its singular simplicity, and the safety which by that success is obtained.

The time when Dr. Jenner made his first public announcement (1798), and for many years after his proposal of substituting vaccine for variolous matter in inoculation, it was encountered by many members of the profession with ridicule and determined opposition. One supplicated George the Third to suppress the destructive practice throughout his dominions. Dr. Monro said it ought to be prohibited by an Act of Parliament. Dr. Rowley wrote that it brought on beastly diseases, and prefixed to his work a coloured portrait of a cow-poxed ox-faced boy, with a pair of horns alleged to be sprouting. Some were said to bellow like bulls, some cough like cows, and a lady complained, "That since one of her daughters was inoculated, she booed like a cow, and her body was all growing over with hair." Such was the treatment Dr. Jenner received from his professional brethren for many years for one of the greatest benefits ever conferred on the human race in all parts of the world; and it was many years before he got from the Government of our country the yearly salary he so richly deserved.

In our own profession we are not much better than the human; it is scarcely possible to make those that chance sometimes places in situations nature never made them for allow that any improvement can be made. Our cases of rinderpest lately was a perfect specimen of this: not one case of prevention or cure I believe ever occurred in Edinburgh; but from it, both by cattle and sheep, the disease was diffused over the country, where in many cases preventive means were perfectly successful. In this part of the country the same means, or no means at all, were taken. The whole stock of some farmers went to destruction.

In many cases of successful treatment of virulent diseases I have written to you: glanders was one. And in the case of Mr. Rennie's racing mare Whizgig, I made a successful cure by the trephine (that treatment is of French origin). That mare for twelve years after belonged to a gentleman here (Mr. Patterson). I had made arrangements with her original owner that the payment for her case was to be her

head when she died. I got it, cleaned it, sent to a professor, with an account of the treatment; and, like the human surgeons with Dr. Jenner, he published in his next month's *Veterinary Review*, "That every horse that had glanders ought to be shot." However, I have not taken Mr. Professor's advice. I have two now, well and working, and I operated on one on Monday last.

My most particular reason for writing you now is neither smallpox, cow-pox, nor glanders, but a disease on which I have written you before, a disease that has been hitherto in our lectures, in our books, in our practice, in the human being, and in the animal, considered incurable. That disease is traumatic tetanus. I wrote my first account of it about ten or twelve years ago to you, referring to a horse belonging to Mr. Ingles, Brunston Mills, near Edinburgh. The man that attended him was Mr. Morton, tax collector, now here. Since that time I have had fourteen cases, eleven of which have perfectly recovered; and the fourteenth, which is particularly the cause of my present writing, is a case which, I think, throws new light on the subject, decidedly showing why patients, both man and beast, are considered to be incurable.

You are perhaps aware that my treatment is simply to wrap the animal up in flannel; about six pairs of blankets are required, and every two hours a man puts a pailful of water nearly boiling along the spine. No medicine, no blister, no clyster; keep the poor animal perfectly quiet; let nobody go near him, nor drive him about; he is well in four or five days.

My present case, to which I wish to call the attention of my professional brethren, belonged to a gentleman in the village of Bonyrig, and had been lent to Dr. Maclaren, of Lasswade, was a very fine blood mare. She had fallen with Dr. Maclaren, and cut her head a little above the eye; the wound was nearly healed. She had been used to ride, and was said to have been ridden about thirty miles a day for some days before I saw her. The messenger sent for me seems not to have been very anxious in finding me, as I was at home; but the distance is only about two miles; he was sent back. When I arrived I found the mare had traumatic tetanus; there was a sort of veterinary surgeon there of a kind not very creditable to our professsion; he, along with Dr. Maclaren, was consulting some old book. Blister was being rubbed along the spine, a tobacco-liquor clyster was ready, and I was told she had got aloes. The old plan of murder was going on. I stopped the blister, threw out the tobacco-

juice, ordered six pairs of blankets, which were at once supplied, got a boiler and plenty of water set in order, and two men were instructed to attend her night and day. Next day she was as well as could be expected, but she was breathing rather too quickly; next day she looked well, except the breathing, which, in traumatic tetanus, from the spasm of the diaphragm, is rather difficult and slow. I found the aloes given had been dissolved, forced over by holding up the head. The mare commenced to cough severely; it was then easily seen that bronchitis was caused by that abominable fluid being forced into the lungs; under the exact symptoms of this last disease she died, dropping suddenly dead without a struggle.

For two days before she died the fluid was distinctly perceptible in the bronchial tubes, but she had begun to drink sago gruel. The day before she died I stopped three hours, and in that time she drank three quarts of it. I was perfectly confident that the original disease was subsiding; but the old-fashioned plan of decided murder, by pouring down liquid when the muscles are in a spasmodic state, I am perfectly convinced, has been the sole cause of traumatic tetanus having been hitherto considered certain death, both in man and beast.

I spent two days going to different parts to where I was informed through Dr. Maclaran's servants she was to be taken to, to inspect her lungs. But for some cause that was not wished by some party; and though she was brought past my door in the end to the Duke of Buccleuch's dog-kennel, I was not informed of the fact, though it was known I particularly wanted to see her.

ON VETERINARY EDUCATION.

By J. Barker, M.R.C.V.S., Scarborough.

As the last number of our journal contains so much that is fraught with vital interest to us as a section of the community, who have a greater amount of responsibility on our shoulders than I think the public gives us credit for, with few or none of the advantages and emoluments that justly belong to us, I cannot refrain from expressing my sentiments on the subject of "Veterinary Education," which is brought prominently before us, as originated by Professor Gamgee, with

the thoughts of the editors on the subject, who, I am glad to see, do not think it advisable to adopt it in its entirety. I also hope that they will endeavour to gain further information on the subject from their various correspondents, and that many who seldom take the trouble of appearing in print, will at once place on record their opinions on the subject. Allusion is made to the derangement caused by the apprenticeship clause, which I never heard of, although fully aware such a clause once existed, but supposed that from some reason it was ignored, possibly from its causing a lack of £ *s. d.*, so intimately bound up in all appertaining to the profession and its supporters. My own experience, and that of all others whom I have heard express themselves on the subject, has been in favour of the apprenticeship clause; and surely there must be something absolutely rotten in the system when the profession cannot be supplied by men who have had a practical education, as well as a course of study at College, ending with the obtainment of a diploma, which is allowed to be no protection to our rights and privileges. I am afraid we shall continue to be as far off as ever unless we consider the best means of supplying the country with practical men; and when we reflect that those having the benefit of a college education, rank about one in four of the general body of Veterinary Practitioners, while of those calling themselves simply farriers we may add two to the above number. In the present state of affairs we are left in a great measure to the caprice and whims of our employers' servants, and until such education is much further advanced among the classes we look to for support, I think there is little necessity of extending the student's curriculum at College; if he be possessed of ordinary intellect, and has had a fair education, he cannot fail to succeed if he applies himself to his studies during the two sessions at present required, and, above all things, grounds himself well at the beginning of each term, and learns by system, instead of rote. I contend that the present system of education involves as much or more expense than is justified by the remuneration to be afterwards obtained, except in some favorable instances, where practices are already made for the fortunate ones to step into; hence the reason why parents and guardians hesitate in apprenticing their sons to the profession, also from the instances they have continually before them of the excessive mortality among young members of our body; there being no less than about twenty dead who graduated in 1855-56, out of about a hundred students. Surely disappointed prospects must be one reason

or cause of the above, when it appears, as "Observer" shows, that professors must even descend to "puffing advertisements" in order to obtain practice, and men with diplomas must actually give their services as assistants in order to obtain that insight into practice which has previously been denied them; or else on the strength of their newly-acquired information, slight though it be, must practise on their own account. Something else is needed, more to the purpose, than this mere theoretical information, as many of us know; since this cannot be applied to practice, with a total ignorance of the general routine of the management of live stock, their value, &c., which is generally the first thing our employers look at in their estimates of us. Strange it is that the sister profession, though so much indebted to ours, and so tenacious and jealous of their own rights and privileges, should support us so little, nay even encourage quackery in the veterinary art, or depend on their own skill in equine and other ailments. It seems incredible when I assert that there is scarcely a qualified veterinary surgeon in every twenty miles of this riding of Yorkshire, and that nearly every nobleman is at present employing non-qualified men, who wrongfully usurp the title of Veterinary Surgeon, and have been allowed to do so for years, although I must allow that in many cases the qualified men are but recent introductions in many places, thus showing that we want some means of encouragement to induce young men to go to College, and afterwards to settle down in agricultural districts. I hope something will ere long be determined on, so as to carry out the spirit of the Charter, and enable the public to distinguish the Veterinary Surgeon from the empiric and quack; but first of all an impression must be made on the public at large, and since *Veterinary Medical Associations* are become so much in fashion, it is on them we must rely, and I think the subject well worthy of their attention, and feel assured much might be done through their influence.

A CASE OF ENDOCARDITIS IN THE HORSE.

By Alfred Withers, Student, Royal Veterinary College.

The following case appears to me to possess so much interest to all connected with our profession, that I feel no apology is needed for its publication.

A bay carriage horse, about eight years old, the property of my father, was returned to him some few months ago from hard work, in a very emaciated and poor condition; so much so, that it was thought necessary to send him to the farm, to regain his health and strength. Up to a short time ago he had been doing very well, and had been exercised three or four times a week.

On the 26th of last month he was observed to be slightly off his feed; his ears were cold, and he seemed generally dejected, and dull. He was placed in a large loose box, and some extra clothing was put upon him. We have had a few mild cases of influenza at the farm within the last month; and as nothing very decided seemed to be the matter with this animal, little notice was taken of him, and the case was treated as one of that affection.

On the 29th, however, my brother saw the horse, and found him much worse; his pulse was quick, and intermittent.

I have now to record the symptoms I observed on March 1st and 2nd: they were alike on both days.

The pulse at the submaxillary artery was intermittent. Taking the whole period of one minute, on several occasions, about forty distinct pulsations could be felt. These pulsations were very irregular; the periods of repose also were very variable. At times ten or twelve beats would regularly follow each other; there would then be a rest for fourteen or fifteen seconds: at other times, although each beat could be distinctly felt, all would be irregular and confused.

On auscultating the cardiac region, a most extraordinary state of things was discovered. The heart was contracting at the rate of 150 to 160 beats per minute, powerfully and regularly, but no after sound could be heard to follow each contraction. The sound caused by the contraction of the heart could be distinctly heard all over the thoracic cavity, but more especially at its anterior part; even at the extreme posterior part of the right side the sounds could be distinctly heard and counted.

On placing the finger on the radial artery at the same time that the ear was applied over the region of the heart, no connection whatever could be discovered between the contractions of the heart, and the pulsations at the artery.

There was a great regurgitation of blood up both jugular veins: in one minute 60 were seen and felt.

The respiration was hurried. The animal was very weak, and he seemed in great pain, but his appetite was very good for the last few days of his life.

A mustard plaster was applied twice, and for several hours on each occasion, over the region of the heart: mild stimulating medicines, with the extract of belladonna and salines, were administered every five or six hours.

All treatment, however, proved useless. He was left at 10 p.m. on the night of the 2nd, feeding, and apparently better; the next morning he was found dead.

My father, thinking that from the very unusual symptoms, some extraordinary lesions would be seen after death, expressed a wish that a *post-mortem* examination of the case should be made at the Veterinary College, in order that the students might have an opportunity of seeing the case. Professor Spooner kindly consented to this, and the examination was conducted by Mr. Brown, in the presence of many of the students.

The liver was found to be in a highly congested state, and rapidly undergoing decomposition.

The lungs were here and there slightly congested.

The pericardium was perfectly normal; except that, at its inferior part, there was adhesion between it and the outer surface of the heart, from previous inflammatory action.

The endocardium of the left side of the heart showed that inflammatory action had been going on. Small particles of fibrinous deposit, about the size of a pea, were found on the surface of the membrane; some were loose, not attached to the endocardium, but entangled as it were in the chordæ tendinæ, others were adherent to the endocardium. Under the surface of the endocardium of the left auricular ventricular valve were small fibrinous effusions, about the size of small peas; these were three or four in number, and situated about the middle of the flaps. The endocardium of the right side was greatly congested and inflamed. Both in the auricle and ventricle large fibrinous coagula existed—that in the auricle was long and snake-like; in the ventricle the coagulum was very large, almost filling the cavity, but neither were adhering to the endocardium.

And now, how are the symptoms manifested by the animal during life to be reconciled with the *post-mortem* appearances?

In the first place it must be borne in mind that the symptoms were very distinct, and they are well-authenticated, for my brother, Mr. Henry Withers, M.R.C.V.S., and Mr. W. Jackson, one of the students at the Royal Veterinary College, were witnesses to them.

There must always be a certain amount of obscurity about

the relation of symptoms observed during the life of an animal to appearances seen after death, from the fact that although we see and describe symptoms from day to day, of diseases animals are suffering from, it is rarely we have an opportunity of seeing them at the time of their death; consequently we do not know if they die manifesting the same symptoms observed some hours before. Especially is this the case with the disease under consideration, when it is attended with the same results, viz. coagula of fibrin; for it seems to me that coagula might have existed in this case in the left ventricle sufficiently large to give rise to great disturbance to the functions of the valves, and so cause the symptoms observed, and have been subsequently broken up, and carried away by the circulation; and becoming lodged in some large trunk or vessel, have caused obstruction to the flow of the blood, and consequently, the death of the animal. Nor do I think that this is quite improbable, for I regret to say that examination was not made of the aorta, or the large venous trunks of the body.

Yet, on the whole, it is most probable that the symptoms and the death of the animal were caused by the coagula which were revealed by *post-mortem* examination. Taking this view of the case, I do not think the symptoms are irreconcilable with the *post-mortem* appearances; I think one in a great measure explains the other. The coagulum in the right auricle, by its obstruction to the flow of blood into that cavity from the systemic veins, would certainly account for the regurgitation of blood up the jugulars. The coagulum existing in the right ventricle, by the great venous congestion it would cause, and by the obstruction to the flow of blood to the lungs, and consequently to the supply of blood to the left side of the heart, does, I think, accounts for the great difference perceived between the action of the heart, and the pulse at the arteries. The inflammatory condition of the heart itself would be sufficient to cause it to palpitate in the manner observed; the comparative emptiness of the left side of the organ, in consequence of the obstruction of the flow of blood to it, would be sufficient to account for the absence of any pulsatory action at the artery at times.

As to the disease existing in the liver, I think that is easily accounted for by the great venous congestion we have considered. Of all other organs of the body the liver, from its connection with the posterior vena cava, would be most liable to suffer under circumstances of this kind; for, from the soft nature of its parenchyma, and its extreme vascularity (consisting, as it does, almost entirely of cells and blood-

vessels), anything which would obstruct the flow of blood from it, would be certain to cause its congestion.

However unusual we may consider a case of this kind to be, we must remember that the horse is liable to become affected with endocarditis, although not so frequently affected with it as is the human subject; this being the case, when it does occur, we should be prepared for its results, and for the symptoms which are likely to be caused by those results. I mention this because a good deal of incredulity has existed in the minds of some, to whom I have narrated this case, and who have even seen the *post-mortem* appearances; I think many of these have not considered well the appearances they observed, and the results that would be likely to follow from their influence on the circulation.

I may add that the coagula observed in this case differed in no way from those found so often in the cavities of the heart, especially after a lingering illness; except that they were very large, and occupied both right auricle and ventricle.

A great deal has been said in medical works on the means for distinguishing endo- from peri-carditis, by peculiarities in the murmur, &c. With our patients there are many reasons why auscultation, especially of the cardiac region, should be most unsatisfactory as to its results with reference to this subject; but, in cases where the symptoms are so well-marked, and where they point so unmistakeably as in this instance, to the seat of the affection, I do not think we need hesitate in proclaiming our diagnosis.

Facts and Observations.

Methylated Spirits.—The Commissioners of Inland Revenue in their Eleventh Report, lately issued, state that there has been a reduction in the quantity of methylated spirits from 1,070,897 gallons in the year ending March 31st, 1866, to 1,031,214 in the subsequent year. This is accounted for by an alteration which has been made in the law so as to prohibit the use of that kind of spirit in medicinal preparations for internal use. In previous reports reference was made to the fraudulent practice of making a compound of methylated spirit, which, under the pretence of being used

as a medicine, was in reality sold as a stimulant in the place of ordinary spirits. This practice was also intimately connected with the application of methylated spirit to purposes for which, although not expressly prohibited, it was never intended—namely, the preparation of tinctures and of medicines for internal use, "an application of that spirit which the Pharmaceutical Society considered highly objectionable." By 29 and 30 Vict., c. 64, s. 8, the use of methylated spirit in any preparation which can be used internally as medicine is entirely prohibited. Sulphuric ether and chloroform, which are in extensive use in arts and manufactures, are excepted from the prohibition. Methylated spirit may also be still employed as a solvent or agent in the production of medicines, provided no spirit or derivative thereof shall remain after the completion of the process.—*The Lancet.*

Fungi in Disease.—At the meeting of the Pathological Society on Tuesday last, the President announced that he had received from Professor Hallier, of Jena, the observer who last year published the statement that he had traced a constant connection between cholera and the existence of a certain fungus in the intestinal canal, a letter, in which he communicated the fact that he had established, as he believed, a connection between six diseases and different species of fungi. These are, variola and the allied diseases, variola ovina and vaccinia; measles, typhus, and typhoid fevers. In the three latter the fungi were discovered in the blood. In the three former Mr. Simon presumed that the fungi were found in the vesicles or pustules. This fact was stated to have been verified by the examination of specimens taken from different sources and in different epidemics. If confirmed, it is difficult to overrate the interest and value which attach to it.—*Med. Times and Gazette.*

Production of Disease by Fungi.—Dr. J. H. Salisbury, who, it will be remembered, a year or two ago announced that he had discovered a connection between certain palmelloid cryptogamic bodies, which he named "ague plants," and intermittent fever, now publishes, in the January number of the *American Journal of the Medical Sciences*, that he has observed two new algoid vegetations, one of which he believes to be the cause of syphilis, and the other of gonorrhœa. The *Crypta syphilitica* he describes as a minute, transparent, highly refractive algoid filament of uniform structure, having the extremities obtusely rounded.

They are developed from spores, and may be straight, coiled, or arranged in curves. Dr. Salisbury states that he has found these filaments in the bed of chancres and in the blood of persons affected with secondary syphilis. The *Crypta syphilitica* finds a fertile soil in the connecting tissues. The *Crypta gonorrhœa*, also an algoid plant, having a filamentary form, according to Dr. Salisbury, is limited in its invasion to the epithelial tissue, whilst the *Crypta syphilitica* is mainly confined to the connective, cartilaginous, and osseous tissues. Several figures of these algoid vegetations are appended to Dr. Salisbury's paper.—*Med. Times and Gaz.*

Sewage Value.—Mr. Morton has published a most interesting account of the "agricultural experience of 30,000 tons of London sewage in 1867" at the Lodge Farm, Barking. Impartial common sense stamps every line that Mr. Morton writes on the subject. On the one hand he rebukes "ignorant impatience" which expects that sewage shall yield up its treasures without care or skill on the part of the cultivator:—"Sixpence worth," he says (page 9), "of the nitrogen or ammonia, whether of guano or of sewage, or of the phosphorus, whether of bone-dust or of sewage, will not necessarily create sixpence worth of additional fertility by its use in agriculture. It may do this or more in skilful hands, but it is quite as possible that it may be thrown absolutely to waste, or even made mischievous and injurious." He gives a most valuable account of the mistakes committed in laying out the experimental farm at Barking, and confesses that not all the sewage *applied* has been profitably *used*. "But," he adds (page 28, "I believe we have proved that every 100 tons of sewage *used* during the past year have actually produced, under circumstances of average favourableness, one ton of grass over and above the quantity needed to pay an ordinary rent and an ordinary farm labour-bill. What that ton of grass is worth depends, of course, upon the use that is made of it. During the height of the summer we sold about £20 worth of it weekly, partly delivered in London, eight or nine miles off, at 23s. per ton, to cowkeepers; and partly sold at home at 1s. and 1s. 3d. per perch, equal to from 18s. to 20s. a ton upon the land. I need not go into our experience on the farm as large cowkeepers, by which an attempt was made to realise some of the experience of the London cowkeepers, who were able to pay us 23s. a ton for the grass we sold them. That is another subject altogether. Whether our business as cowkeepers was profitable or not, the fact remains that, under the circum-

stances, we grew 2488 tons of this grass on very poor and gravelly soil off 55½ acres with the help of sewage only, and 61 tons per acre off that portion of it which alone represented fair and average circumstances." He admits that the sewage was occasionally foul; still it is clear that, with some discretion as to quantity, the land may be enriched and the nuisance suppressed.—*Med. Times and Gaz.*

Fallacy in Testing for Albumen.—Mr. Fox, Medical Officer to the North-Eastern Dispensary, has forwarded the following communication to the *Medical Times and Gazette*:—"I think the following will be found important as indicating another, and, I believe, a hitherto unmentioned fallacy in testing for albumen. Some weeks ago I paid a visit to an elderly gentleman in the country. I found œdema of both legs, and tested the urine, which gave a very distinct white cloud on boiling, and a very positive white stratum on being poured above nitric acid. Of course I included albuminuria in my diagnosis. My diagnosis was, however, happily corrected soon after by the very intelligent resident practitioner who watched the case. The nitric acid used contained silver in some considerable amount, and gave a chloride cloud on mingling with the urine. The fact that a large quantity of acid so contaminated was supplied to the London Hospital to be used for testing as well as for other purposes, proves our liability to this fallacy, and justifies me in bringing it before the notice of your readers."—*Med. Times and Gaz.*

Effects of Electricity on the Germination of Seeds.—M. Blondeau has made a series of experiments, from which it appears that seeds subjected to a weak induction current, and afterwards caused to germinate, will sprout twice as fast as those that have not undergone the action of electricity.

To obtain Cantharidin.—M. Bluhm recommends for the obtainment of the active principle of cantharides, that the powdered flies be rubbed with one third their weight of calcined magnesia and a little water, which mixture is to be dried in a water-bath. When dry it is to be saturated with dilute sulphuric acid, and then repeatedly shaken with ether. The ethereal extract is now to be washed with water, and the ether distilled off. The residue is cantharidin, mixed with fat and a yellow substance. The former is removed by means of bisulphide of carbon, the latter by alcohol.

Omne Vivum ab Ovo.—"All creatures that we know of originate in a bud or an egg. Probably the egg always appears at some part of the series, and it is now certain that the most developed creatures, the mammalia, thus commence their being. Man and the silkworm both spring from eggs. In the higher forms of animals the hatching process precedes birth; in the lower the egg enters the world, and changes take place within it which eventuate in the appearance of the infant stage of the creature that is hatched."

Rock Salt.—The Prussian Government has been recently making active researches in the kingdom to discover fresh mines of salt. The borings, executed under the orders of Count d'Itzenplitz, Minister of Commerce, have now led to the discovery of a rich deposit of that mineral near Sperenberg, to the north of Lake Krummsee, at a distance of twenty-two miles from Berlin. The salt is found at a depth of 300 feet from the surface.

Scientific Agriculture.—An increased desire seems to be manifested by our leading agriculturists to extend the benefits of professional or scientific agricultural education. There is no questioning the fact, that the lack of this is accompanied with great loss. We need only refer to the utilization of sewage; a problem as yet, perhaps, not completely solved. Nevertheless it is notorious, that annually is poured into the sea 100,000,000 tons of food-producing material. On grass lands this has a high fertilizing effect.

Again, it has been found, that through want of calculation the drainage of land has been sometimes carried on to too great an extent, so that should a period of dry weather occur, the farmer finds his crop to suffer for want of water. Irrigation has been suggested as the remedy for this, and Professor Voelcker has been requested by the Agricultural Society to take up the subject.

Absorption by Soils.—Dr. Voelcker states—

1. That calcareous clay soil absorbs six times as much ammonia from liquid manure as sterile sandy soil.

2. That liquid manure in contact with calcareous clay soil becomes much richer in lime, whilst during its passage through sandy soil it becomes poorer in lime.

3. That calcareous soil absorbs much more potash than sandy soil.

4. That chloride of sodium is not absorbed to any extent by either soil.

5. That both soils remove from liquid manure most of the phosphoric acid.

6. That the liquid in passing through calcareous soil becomes poorer in soluble silica, but in passing through sandy soil richer.

Composition of Bones.—Dr. F. G. Calvert gives the following as the general composition of bones:

Organic substances	Blood-vessels	1
	Osseine	32
	Fatty matters	9
Mineral substances	Water	8
	Phosphate lime	38
	Phosphate Magnesia	2
	Carbonate lime	8
	Divers salts	2
		100

The Brown Trust.—The general scheme upon which the "Brown Trust" is to be administered is now agreed upon. The University of London is seeking a suitable building on the south side of the Thames, either from the Government or in connexion with one of the large hospitals, wherein scientific investigations may be conducted in regard to the diseases of animals. We hear that a Professor of Comparative Pathology is to be appointed at a salary of £300 a year, and it is thought that some of the younger graduates of the University will be disposed to devote their time to the duties of the post and the elucidation of pathological questions.—*Lancet.*

Tapeworm in America.—Dr. Wood, of Atlanta, in a paper in the *New Orleans Journal of Medicine*, notes that the extraordinary prevalence of tapeworm since the war has been a subject of remark by members of the profession in his neighbourhood.—*Ibid.*

THE VETERINARIAN, APRIL 1, 1868.

Ne quid falsi dicere audeat, ne quid veri non audeat.—CICERO.

LEGISLATION UPON CONTAGIOUS DISEASES.

IRELAND has taken the initiative in legislation upon the subject of infectious diseases of animals, and at a very opportune moment. Public attention has been attracted to the important questions of the transit of diseased cattle, and the injury which arises to producer and consumer from the laxity which has long prevailed in respect to proper and practicable isolation of animals, which are not only themselves the subjects of virulent maladies, but are also capable of transmitting their diseases to healthy animals, even by indirect contact, or through the medium of the hold of a ship or a railway truck.

Throughout the course of the sad experience which we have just passed, the Irish executive acted with vigour and forethought. At the commencement of the outbreak of cattle-plague in England, they obtained an order prohibiting the landing of cattle in Ireland from any part of England, and further, in view of the probability of the conveyance of the infection by indirect agencies, provisions were made for disinfecting drovers, and persons engaged in the cattle-trade. A Veterinary Department was established; inspectors were appointed, and everything was held in readiness to deal summarily with the disease should it, in spite of precautions, obtain an entrance into Ireland. The result proved that the caution exercised was not in vain. Although in defiance of prohibitions on importation of live stock, the veritable rinderpest did make its appearance among cattle in a remote district in the north of Ireland, there was no difficulty experienced in effecting its eradication, by the adoption of the stamping out system, which was applied with Prussian promptness and rigour. The plague was detected among some cattle at Drumra, in May, 1866, and in the beginning

of July following all trace of the malady had ceased to exist. Very little inconvenience was occasioned by the necessary restrictions, and the loss, which in England amounted to more than six per cent. of the whole stock of the country, did not, in Ireland, reach much beyond a total of fifty cattle.

Irish stock, however, still suffer from other contagious affections which, whether introduced from abroad or not have now a permanent existence in the country. Pleuro-pneumonia, and mouth and foot complaint in cattle; foot-rot and scab in sheep, and typhoid fever in pigs, together destroy large numbers of animals yearly, and recent introductions of pleuro-pneumonia infected stock into this country have doubtless had the effect of deterring grazing farmers from purchasing so largely as the present state of this country requires. The Irish Executive, however, has again taken a vigorous course, as the annexed Order in Council will demonstrate. The provisions of the rule are sweeping, but not more so than the exigences of the case demand. No animal suffering from "any disease whatsoever," can be imported to or exported from Ireland, or carried in any railway-truck or boat with healthy stock; and no animals affected with a contagious disease can be exposed in a fair or market, or still better, can be removed from any farm, or premises in which they have been for more than six days prior to such removal. This prohibition against the movement of infectiously diseased animals from premises, is precisely what we suggested in our article on the transit of diseased animals in our last issue; it cuts at the root of the difficulty, and we hope it will not be long before an equally comprehensive and wholesome sanitary order shall be applied to the cattle traffic in this country, with the addition of what we have always contended for;—arrangements which will ensure the effective administration of every provision.

Subjoined we print the Irish Order *in extenso*.

Copy of an Order in Council.

By the Lord Lieutenant of Ireland in Council.

ABERCORN.

Whereas by an Order in Council, bearing date the 17th day of January, 1868, made in pursuance of "The Cattle Disease Act (Ireland), 1866," and of the statutes therein mentioned, it was, amongst other things, ordered that from and after the time therein mentioned it should not be lawful to remove or move along any public high road or way, street or place, or by any railroad, rails or tramways, canal, river, or public stream, or by boat, vessel, or steamer, or any public conveyance, or to expose in any market or fair in Ireland, or to export from Ireland, any Cattle (meaning any Cow, Heifer, Bull, Bullock, Ox, or Calf) affected with foot or mouth distemper, or any Sheep affected with foot or mouth distemper, foot rot, or scab.

And whereas it is deemed expedient and necessary for the purposes in the said Acts mentioned to make the Orders and Regulations hereinafter contained.

Now We, the Lord Lieutenant of Ireland, by and with the advice of Her Majesty's Privy Council in Ireland, do hereby, in exercise of the powers vested in us by the said statute called "The Cattle Disease Act (Ireland), 1866," and of the other statutes therein mentioned, order as follows :—

1. This Order shall take effect from and after the publication thereof in the *Dublin Gazette*, and the word Cattle henceforth in this Order used shall be interpreted to mean any Cow, Heifer, Bull, Bullock, Ox, or Calf.

2. The said in part recited Order, dated the 17th day of January, 1868, is hereby revoked without prejudice nevertheless to the prosecution of any offence that may have been committed against the said in part recited Order, or to the recovery of any penalty in respect of such offence.

3. It shall not be lawful for any person or persons to land from any ship or vessel, in any place or port in that part of the United Kingdom of Great Britain and Ireland called Ireland, any Cattle, Sheep, Swine, or Goats, affected with any disease whatsoever.

4. It shall not be lawful for any person or persons to move any Cattle, Sheep, Swine, or Goats, affected with any disease

whatsoever, from any port or place in Ireland aforesaid to any port or place in Great Britain aforesaid.

5. It shall not be lawful to expose in any market, fair, or public place, any Cattle affected with pleuro-pneumonia, or foot and mouth or aphthous distemper, or any sheep affected with foot and mouth or apthous distemper, or any swine affected with foot and mouth or aphthous distemper, or typhus, or scarlatina, or smallpox, or the malady generally known as "the Soldier," or the "Red Disease," or with Swine Cholera.

6. It shall not be lawful to move or remove any Cattle affected with pleuro-pneumonia, or foot and mouth or aphthous distemper, or any Sheep affected with foot and mouth or aphthous distemper, or any Pig or Swine affected with foot and mouth or aphthous distemper, or typhus, or scarlatina, or small-pox, or the malady generally known as "the Soldier," or with Swine Cholera, from any farm, lands, premises, or place in which such animal or animals has or have been for more than six days previous to such removal: provided always that nothing in this Order contained shall prevent the movement or removal of an animal so affected for immediate slaughter, that is to say—such animal to be slaughtered within forty-eight hours from the commencement of such movement.

7. It shall not be lawful to permit any Cattle, Sheep, Swine, or Goats, affected with any disease or distemper whatsoever, to be carried along any railway, or to be or remain in any pen, carriage, truck, horse-box, vehicle, or boat, along or in company with any healthy Cattle, Sheep, Swine or Goats.

8. Every pen, carriage, truck, horse-box, vehicle, or boat, from time to time, and as often as it may be used in the safe keeping or transit of any Cattle, Sheep, Swine, or Goats, shall be cleansed and disinfected within twenty-four hours from the time when it shall have been last in use, and before it shall be used again, and such cleansing and disinfection shall be effected in the following manner:—

By sweeping out and effectually removing all dung, sawdust, litter, or other matter from the pen, carriage, truck, horse-box, vehicle, or boat, and then by thoroughly washing the same with water, and then by applying to the floor and to all parts above the floor of the pen, carriage, or truck, and to the sides, floor, and ceiling of the hold of the boat, and to every other part of the boat with which animals or their drop-

pings come in contact, a coating of limewash made up by mixing good freshly burnt lime with water, and containing in each gallon of lime-wash four ounces of fresh dry chloride of lime, such lime-wash to be prepared immediately before use. The sweeping shall be well mixed with quick lime, and effectually removed from contact with animals.

9. Every person acting in contravention of this Order shall, for each offence, incur a penalty not exceeding Twenty Pounds, and every person shall be deemed guilty of an offence against sections 3, 4, 5, 6, and 7 of this Order unless such person shows to the satisfaction of the Justices or Justice before whom such person is charged that such person did not know of the Cattle, Sheep, Swine, or Goats being so affected, and that such person could not with reasonable diligence have obtained such knowledge, or that such Cattle, Sheep, Swine, or Goats were not diseased previous to removal or exposure as aforesaid.

Given at the Council Chamber in Dublin, this 6th day of March, 1868.

FRED. SHAW.
R. KEATINGE.
JOHN HATCHELL.
JOSEPH NAPIER.
JOHN E. WALSH.
HEDGES EYRE CHATTERTON.

Reviews.

Quid sit pulchrum, quid turpe, quid utile, quid non.—HOR.

A Manual of Pharmacy for the Student of Veterinary Medicine. By W. J. T. MORTON, late Professor of Chemistry and Materia Medica in the Royal Veterinary College, &c. Seventh Edition. London: Longmans, Green, and Co., 1868.

PROFESSOR MORTON'S Manual is so well known to practitioners and students of veterinary medicine, and its reputation

has been so completely established by the numerous editions through which it has passed, that our duty of reviewing the last issue of the work necessarily resolves itself into a brief notice of the principal changes and additions to which it has been subjected during its recent revision.

Many and fierce have been the battles waged by chemists about the modes of formulating compounds, and even now there are several systems, so that the selection of any one plan is attended with the greatest difficulty. Mr. Morton has, considering the present unsettled state of chemical notation, wisely adhered to the old formulæ which were generally used for very many years; and he has appended to these what may be termed the unitary formulæ employed by the Council of Medical Education in the edition of the 'British Pharmacopœia,' published last year. Thus the composition of any chemical compound mentioned in our author's Manual will be equally understood by the student of modern chemistry, and the practitioner who acquired a knowledge of this science twenty years ago.

A number of other additions have been introduced, including articles on Carbolic acid, and its pharmaceutical preparations, Local Anæsthesia, and other subjects of equal importance.

The numerous additions considerably enhance the value of the Manual, and continue to render it what it has long been, one of the most practical and useful works on Veterinary Pharmacy in the British language.

The Microscope; its History, Construction, and Application. By Jabez Hogg, F.L.S., F.R.M.S., &c. Sixth Edition. London: George Routledge and Sons, 1867.

Now that the importance of the microscope as a means of intellectual amusement, and an aid to scientific research, is becoming more fully appreciated than it was formerly, our readers will be glad to be informed of the publication of any work which may assist them in their microscopic investigations. It is therefore with a double satisfaction that we are enabled to direct their attention to the issue of the sixth edition of Mr. Hogg's very interesting and useful manual.

In addition to a concise history of the instrument, the work contains plain and concise accounts of its construction and directions for its use. The chapters on these subjects are followed by others on the structure, functions, and modes of

examining the most minute vegetable and animal bodies up to the tissues of the largest members of the organic world.

The book is illustrated by about five hundred well executed wood-cuts, and eight beautifully coloured plates from the pencil of the eminent Tuffen West.

There are other works in which microscopy is treated in a more strictly scientific manner, but we believe no other author has treated the subject in so pleasing a style; one which is, unfortunately, so foreign to English scientific writers, but which seems to be so natural to our French friends. In short, Mr. Hogg's manual is carefully compiled and written in a manner which will allure more recruits to the ranks of microscopy than any other work on the same subject with which we are acquainted.

Extracts from British and Foreign Journals.

THE ATMOSPHERIC GERM THEORY.

(*A Lecture delivered to the Royal College of Surgeons, January* 17, 1868.)

By John Hughes Bennett, M.D., F.R.S.E., Professor of the Institutes of Medicine and Senior Professor of Clinical Medicine in the University of Edinburgh, &c. &c.

Mr. President and Gentlemen,—The subject which I have the honour of bringing before you this evening is one which has engaged the attention of physiologists since the days of Aristotle. That distinguished man, as well as most of the naturalists who lived previous to the time of Harvey, were of opinion that dust, decomposed flesh, and other dead substances, might, under the influence of heat, air, and water, give rise to living beings independently of parents. This mysterious process, by a singular perversion of language, has been called spontaneous generation. We all know the story of the shepherd recounted by Virgil, who thought he saw bees spring up in the dead body of an ox, which was implicitly believed by Pliny; and we have read accounts of rats and frogs which were supposed to be engendered by the fruitful earth or teeming waters.

Francis Redi, a physician of Florence, was the first who clearly demonstrated, in 1638, that the larvæ and worms found in a dead body were not produced by putrefaction, but

originated from flies' eggs deposited in the flesh.* Even he, however, says that he is inclined to believe the entozoa to have a spontaneous origin. The researches into generation, which alone would have conferred undying honour on the name of William Harvey, had it not been associated with the discovery of the circulation, led him to announce the law, "Omne vivum ex ovo." Since his day the belief has been general, that all animals and plants are derived from eggs or seeds; that vitality is always transmitted, and never created; and that, where these fundamental principles cannot be recognised, the minuteness of the germs and their wide diffusion throughout nature, and more especially in the atmosphere, offer a sufficient explanation of what may appear mysterious. Nature, it was argued, must be uniform in her operations, and analogy warrants our supposing that the same law of generation which applies to the higher animals and plants is equally applicable to the lower.†

The cell theory of growth, which was brought forward by Schleiden and Schwann in 1840, gave a new impulse to investigation by means of the achromatic microscope. With this instrument physiologists have now traced the changes which ova and seeds undergo during their development in a vast number of animals and plants, and have even followed the former in their wanderings from the body of one animal, where they originate, into that of another, where they are fully developed. In this way we have an alternate generation, as explained by Steenstrup. In the mouse, for example, we find a cystic worm which, in its body, would be no further developed, but when the mouse is eaten by the cat the cystic is transformed into the tapeworm, which infests the last-named animal. But it has also been shown that certain insects are produced from others without generation by parents. This interpretation in descent Owen has called Parthenogenesis, from παρθηνεια, virginity. Thus, two-winged insects will produce an animal without wings, from which ten or twelve generations of individuals may be derived without a fresh act of conception, until the last in the chain gives forth another winged insect, when the process is repeated—as in the case of the apis.‡ These generalisations, by clearing up some

* 'Experimenta circa Generationem Insectorum.'

† Most of the arguments on the other side, that is, in favour of Heterogenesis, will be found well stated by Burdach ('Physiologie,' tome I, p. 8 *et seq.*) —arguments admitted by Allen Thomson "to throw the balance of evidence in favour of the spontaneous production of infusoria, mould, and the like." (Todd's 'Cyclopædia,' article "Generation," vol. ii, p. 430, 1839).

‡ 'Owen on Parthenogenesis.'

very obscure points in embryology, were supposed to have given the *coup de grâce* to the old notion of spontaneous generation.

The ova, seeds, and primary cells, however, which were supposed to be floating in the atmosphere, though constantly looked for, could nowhere be found, and more careful investigation of the numerous forms of life which spring up in putrescent and fermented fluids utterly failed in connecting them with pre-existing germs. It is, perhaps, unnecessary to remark that our modern microscopes have reached such perfection, that we can examine with the greatest accuracy particles of only one fifty-thousandth of an inch in diameter, which are much more minute than the smallest recognisable ova or seeds. As all efforts, therefore, to discover the supposed germs in the atmosphere with our best instruments have failed, many scientific men who had personally investigated the subject were once more led into the belief of, at least, an equivocal or doubtful generation of the lowest forms of animal and vegetable life. This belief was strengthened by the appearance, in 1859, of a remarkable work by M. Pouchet, Professor of Natural History at Rouen, and a corresponding member of the French Academy of Sciences, on what he called "Heterogenesis, or Spontaneous Generation," as distinguished from Homogenesis, or Generation of Parents. This book contains not only a full history of all that had been previously written and thought on the subject, but gives an account of numerous original experiments and observations made by the author, proving, as he thinks, that infusoria originate in a finely molecular, or, as he calls it, proligerous pellicle on the surface of decomposing fluids, without pre-existing cells or germs of any kind, and therefore independently of parents.

The publication of this book has led to a controversy which has continued up to the present moment. The theory of atmospheric germs, or that of the Panspermatists, has been ably sustained by M. Pasteur, who, by new experiments, has revived the doctrine that fermentation and putrefaction are not chemical processes, as has been maintained by Liebig, but physiological phenomena dependent on living germs derived from the atmosphere. These experiments gained for him, in 1859, the Grand Prize for Physiology annually awarded by the French Academy of Sciences. They have all, however, been since repeated by Pouchet and others, and their accuracy as well as the correctness of his conclusions are by them utterly denied. An extraordinary amount of research, ingenuity, and talent has been displayed by the

advocates on either sides, the results of which will be found recorded in numerous communications printed in the *Comptes Rendus* of the proceedings of the Academy.

Such, then, is an outline of the history of this matter. Before stating more particularly the arguments advanced by the controversialists, on one side or the other, I propose describing shortly the results of some investigations undertaken by myself, with a view of determining precisely the facts of the case, and the nature of the phenomena which have excited so much discussion.

My attention was originally directed to the origin of fungi in 1841, when examining the parasitic plants found growing on living animals, an account of which was published in the *Transactions of the Royal Society* in this city in 1842. In October, 1863, after studying the memoir of M. Pasteur, I commenced a series of observations, with the aid of my former assistant, Dr. Argyll Robertson, which were directed (1st) to determine with exactitude, by means of the microscope, the changes which occurred on the surface of infusions during the developmen of plants and animals there; and (2nd) to ascertain what influence the air treated in various ways exercised on such growths. These observations were carefully repeated and extended in October, 1864. They have again been recently repeated, and numerous other experiments have been performed, with the aid of my present assistant, Dr. Rutherford. These investigations naturally divide themselves into (1st) observations by means of the microscope as to the development of infusoria; and (2nd) experiments directed to destroy the supposed germs in the atmosphere so as to prevent putrefaction.

1. *Mode of Development of Infusoria.*

On making a cold or hot infusion of any vegetable or animal substance, covering the vessel with a piece of paper so as to exclude the dust, and then watching it every twelve hours, the first change visible to the eye is a slight opalescence, and the formation of a thin scum or pellicle that floats upon the surface. This appears at times varying from a few hours to several days, according to the temperature of the atmosphere or the nature of the infusion. On examining the pellicle or film under high magnifying powers,* it is seen to

* The powers I have employed for the investigation were an excellent lens of $\frac{1}{8}$th of an inch focus, by Ross; but I also frequently used a $\frac{1}{12}$th of an inch by the same maker, and the immersion lens No. 10 of Hartnach, with varying powers of from 600 to 800 diameters linear. Occasionally I con-

be composed of a mass of minute molecules, varying in size from the minutest visible point to that of one thirty-thousandth of an inch in diameter. These molecules are closely aggregated together, and must exist in incalculable numbers. They constitute the primordial mucous layer of Burdach,* and the proligerous pellicle of Pouchet.† The same pellicle, examined six hours later, shows the molecules to be somewhat enlarged, and these separated by the pressure of the upper glass are already seen here and there to be strongly adhering together in twos and fours, so as to form a little chain. Many twos, also, have apparently melted together so as to form a short staff or filament—*bacterium*. (Fig. 1, *b*.) Twelve hours after this, it may be seen that the grouping of the molecules in twos, threes, and fours has become more general, and that several of these form new groups of eight lengthways. Many of them have melted together to produce longer bacteria. At the edges of the molecular mass, and in the fluid surrounding it, may now be seen a vibratile movement in the shorter bacteria and a serpentine movement in the longer ones, whereby they are propelled forwards in the fluid—*vibrio*. (Fig. 1, *c*, *d*.) From the second or third to the fifth or seventh days, the vibrios are lengthened, evidently by apposition of groups of other molecules to their ends. These melt together to form a filament, which may extend a third or half, and in a few cases entirely, across the field of the microscope. (Fig. 2.)

Fig. 1.

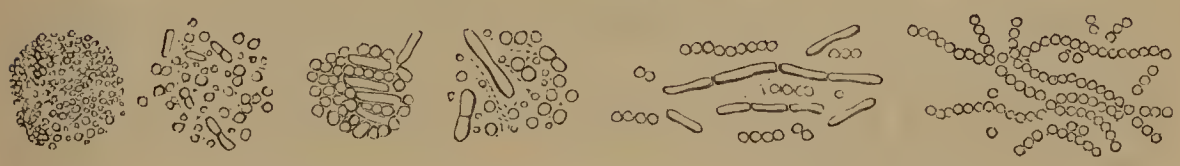


Fig. 1.—*a*. Molecular structure of the proligerous pellicle on its first appearance in a clear animal infusion. *b*. Molecular structure of the same, six hours afterwards. The molecules are separated, and several are seen grouped together in twos and fours. Some of these have melted together so as to produce bacteria, which exhibit a trembling movement. *c*. The structure of the proligerous pellicle on the second day. *d*. The same separated. The molecules are coalescing in rows and melting together to form longer bacteria or vibrios, which move rapidly across the field of the microscope. As their development proceeds, they present the appearance seen in *e*, and in Fig. 2. *f*. Long filaments composed of adhering molecules, 800 *diameters linear*.

The movements visible in the molecules and filaments vary

firmed my observations with a lens recently made for me by Messrs. Powell and Lealand, of $\frac{1}{25}$th of an inch focus, whereby I obtained an enlargement varying from 1250 to 2000 diameters linear.

* 'Physiologie,' par Jourdan, tome ii, p. 123.

† 'Hétérogénie,' p. 383.

according to the amount of development. At first the molecules which float loose in the fluid exhibit gyrations which cannot be distinguished from Brunonian movements. When short bacteria are formed these exhibit peculiar vibrations—often turn round on their own axis in various directions, and are slowly changing their place. They rarely dart rapidly through the fluid, or exhibit a serpentine motion. But when the vibrio is formed the filament is pushed forward with greater or less velocity, at first presenting a wriggling, but, as it becomes longer, a more decided serpentine motion. A distinct flexure can be seen at certain points in the filaments, between the groups of molecular chains or filaments. Dumas

Fig. 2.

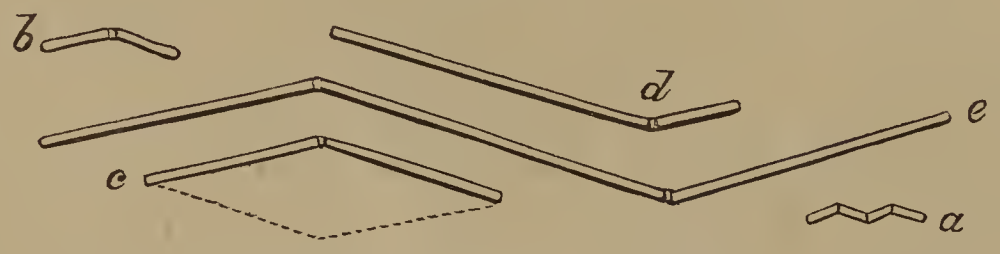


Fig. 2.—*a.* Vibrio with a serpentine movement. *b.* Vibrio with one flexure, evidently formed by the union of two bacteria. *c.* Elongated vibrio with one flexure, the area of the movement marked by a dotted line. *d.* An elongated vibrio, not moving; a bacterium evidently added at one extremity. *e.* An elongated vibrio with two flexures, moving rapidly across the field of the microscope. An observation of these vital structures evidently indicates aggregations of bacteria and vibriones of a certain length endways, the flexures occurring at the points of junction, 800 *diameters linear*.

says he has seen the molecules and bacteria uniting endways, a statement the correctness of which Pouchet doubts.* On two occasions, however, I was fortunate enough to see this occurrence as represented in the accompanying figures. (See Figs. 3 and 4.)

Fig. 3.

Fig. 4.

Fig. 3.—*a.* Position of two short bacteria. *b.* The lower bacterium was seen to sink down and unite itself to the upper, and then the two turned round in unison as in *c* and *d*.

Fig. 4.—*a.* Position of two bacteria. *b.* Altered position of the same. *c.* The lower one adhering to the upper. *d.* The two turning together to *e*. *f.* Vital flexure at the middle; and *g*, four flexures, when I saw the vibrio so formed move forward out of the field of the microscope. 800 *diameters linear*.

* 'Nouvelles Expériences,' p. 115.

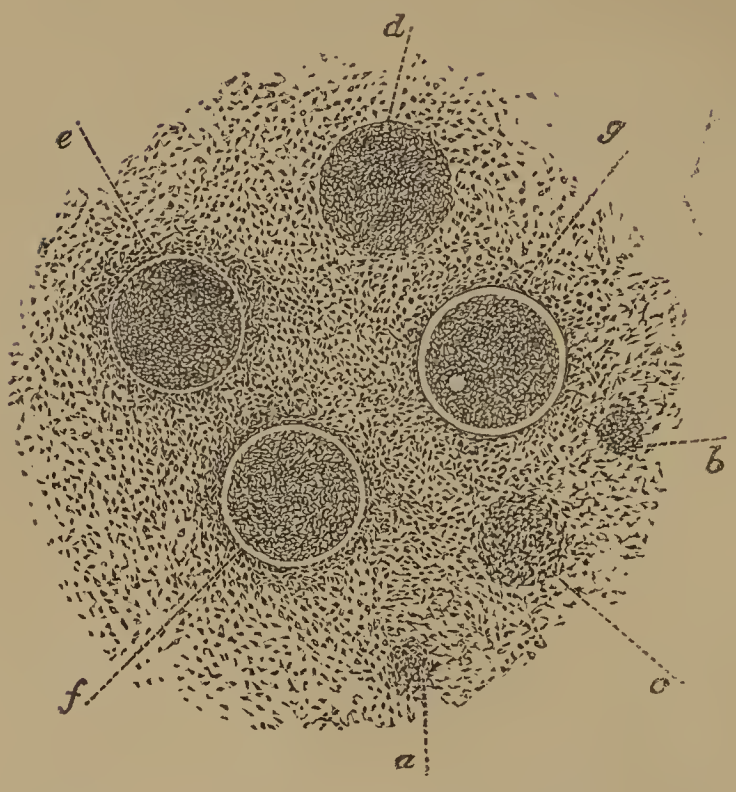
Pouchet thought that the vibriones exuded a mucous matter, whereby one stuck to the other. If so, such exudation can only be poured out at their extremities, as they only unite lengthways, never crossways. I feel satisfied, however, that the reason the actual union has so seldom been seen is, 1st, That it only occurs at certain periods of development, and can only be followed by the eye, when the novements are slow; 2nd, That amidst such a multitude of minute moving bodies it requires a long time before two can be found exactly on one plane, and can be brought so accurately into focus that they can be watched for a sufficient time. Having, however, in the two instances described and figured, actually seen the coalescence, I can have no doubt whatever that such is the true method of elongation. Numerous other facts seen among elongated vibriones support this view (see Fig. 2).

It may frequently be seen, on again examining the fluid in which these bodies have been moving actively, that they are all motionless, evidently dead. This occurs at various periods. They now rapidly disintegrate, and thus a second molecular mass or pellicle is formed. In this, rounded masses may be seen to form, which strongly refract light not unlike pus-corpuscules, or the colourless corpuscles of the blood. These soon begin to move with a jerking motion dependent upon a vibratile cilium attached to one of its extremities—*Monas lens*. In a day two other cilia are produced, the corpuscle enlarges, is nucleated, and swims through the fluid evenly. Varied forms may now occur in the molecular mass dependent on the temperature, season of the year, exposure to sunlight, and nature of the infusion, all having independent movements. They have been denominated *Amœbæ, Paramecia, Vorticellæ, Kolpoda, Keronæ, Glaucoma, Trachelius, &c. &c.**

Pouchet describes the *Paramecium* as originating in the proligerous pellicle, formed by the breaking down of the primary bacteria and vibriones. It is the secondary histolytic mass of molecules which arrange themselves as seen in Fig. 5.

* See Ehrenberg's 'Infusoria.'

Fig. 5.



Formation of Ova in the proligerous Membrane.

a. Coalescence of molecules. *b.* The same more advanced. *c.* Still larger mass. *d.* The same assuming a rounded form. *e.* A membrane formed externally. *f.* A nucleus apparent, and complete differentiation of the now perfect ovum from the surrounding molecular mass.—*Pouchet.* 250 *diameters.*

(*To be continued.*)

THE FORMER RANGE OF THE REINDEER IN EUROPE.

By W. Boyd Dawkins, M.A., F.R.S., F.G.S.

The Reindeer is the only member of the great genus Cervus fitted by nature to endure the extreme severity of an arctic winter. It thrives on the mosses that cover the great treeless spaces extending between the boundary of the woods and the great arctic sea, in Northern Europe, Asia and America, which it seems to prefer to the more tender herbage further to the south. It is found also at the extreme edge of the woods both in Asia and America, and retreats to their recesses to find some sort of shelter and food during the depth of the winter. South of its habitat lies the region of the elk and the red-deer, the exact boundary being regulated according to the season. Thus in an unusually warm summer the two latter animals advance northwards into the country of the reindeer, while in an unusually severe winter the reindeer passes southwards in search of food, as Sir John Franklin found out to his cost in his overland journey from the great

arctic ocean. In this way the boundary is continually oscillating to and fro. The reindeer has been met with in the highest northern latitudes yet reached by our explorers. It abounds in Greenland and Spitzbergen, and has even crossed over on the ice to the cluster of islands off the Siberian coast, called New Siberia. In the highlands of Norway and Sweden it is also found, as well as in the loftier regions of the Urals.* Such is its present range. In past time, however, it wandered over a vast area far to the south and west of its present abode; what that range was and the causes of its modification are subjects well worthy of research, on account of the light they throw on European climate in former days. It has indeed been objected, that although climate exercises a great influence in modifying range, it does not exert the only influence, and therefore that any argument from one to the other is faulty. The Bengal tiger is of the same species as that which preys on the Tartar horses on the shores of the Caspain, and on the reindeer of Eastern Asia. The fox and the wolf are also, as Cuvier remarked, adapted for enduring any climate; it is clear, therefore, that you could not infer climate in past time from the presence of any of these animals. This objection is indeed partly true; the carnivora can live wherever they can obtain their prey, climate being of secondary importance; but the food of the herbivores is *directly* dependant upon climate, and as vegetation is divided into regular zones, according to the temperature in each, so the herbivores are also divided, each species being fitted best to live on the food which surrounds it, while the carnivores can thrive in any of the zones. We can, therefore, reasonably infer the climate from the study of the herbivores.

We propose to trace the reindeer from its first known appearance in western and middle Europe to the present day, from the Pleistocene, through the Pre-historic, into the Historic period, and draw whatever inferences we can as to climate. The identity of the fossil with the recent reindeer first surmised by M. Guettard, in the first quarter of the present century, was proved by Professor Owen in 1834; and since that time ample materials have been accumulated for determining the former range of the animal.

The Pleistocene period in France, Germany, and Britain is divisible into three great epochs; the first of these, or the Pre-glacial, is that during which the land was more highly elevated above the sea than at the present day. Britain formed part of the mainland of Europe, and the character of the fauna shows that the climate was, to say the least, tem-

* Pennant, 'Arctic Zoology,' vol. i, p. 24.

perate. This latter condition was probably the cause of the non-existence of the reindeer in Pre-glacial Europe; although according to the views lately put forth by Professor Brandt, of St. Petersburg, it was living at the time in the colder climate of Northern Asia. The land was depressed, and hill and valley alike sank beneath the waves of the sea; the temperature also was lowered, so that glaciers flowed down the hills of Cumbria, Wales, and Scotland, and all the high mountains of Europe; and icebergs deposited their load of sand, mud, and fragments of rock throughout the greater part of Russia, the lowlands of Germany, and the centre of England. Whether this change of temperature was gradual or not is an open question, and probably must ever remain so. Had it, however, taken place before the depression of the land, the reindeer would most certainly have been found in pre-glacial or glacial deposits; for as there are no geographical barriers in the way, the arctic group of animals dwelling in Siberia would have migrated into Europe as the conditions of life became more and more suitable for them. There is not, however, the slightest trace of any of them in any deposit which is undoubtedly pre-glacial or glacial, and therefore the inference may be drawn that before the lowering of the temperature in Central Europe the sea had already rolled through the low country of Russia, from the Caspian to the White Sea and Baltic, and formed a barrier to the western migration of the arctic mammals of Asia, when arctic conditions favourable for their living were found in the higher parts of Europe which were not submerged. Subsequent to this great glacial epoch the land gradually rose, Britain again formed part of the continent, and a path was opened for the immigration of the arctic animals into Germany, France, Britain, and Ireland.

The reindeer makes its first appearance in Western Europe in caverns and river gravels and sands of post-glacial age. Its abundance in British deposits of this date has been altogether overlooked up to the present day. In the cavern of Kirkdale* its antlers have been described by Dr. Buckland as those of a small deer; their gnawed condition proves that the animal fell a prey to the great cave hyæna. Strangely enough, in the same cavern were obtained teeth of the hippopotamus, so that we have two animals associated together, the one confined at the present day to an arctic region, the other belonging to a genus that now ranges through the length and breadth of Africa. In Kent's Hole, also, the same two animals were found by the Rev. W. MacEnery.

* 'Reliquiæ Deluvianæ,' 4to., 1824.

In Wooky Hole Hyæna-den it occurs along with the remains of man and those of the Leptorhine and Tichorhine rhinoceros, the cave lion, cave bear, mammoth, and red-deer. In other caverns also in the south of England it is very abundant—at Banwell in association with the leopard and otter, in Brixham with the grizzly bear and roe-deer, in Hutton with the Irish elk, at Uphill with the wild boar, at Oreston (which furnished Professor Owen with the first proof of the existence of the animal in bone-caverns) with the great urus, at Berry-head with the pole-cat. In Wales also it is most abundant in the caverns of Pembrokeshire—in Paviland with the wolf, and in Gower with the leptorhine rhinoceros and man. It is indeed so abundant in Britain that it occurs in no less than thirteen out of twenty-one caverns, the contents of which have passed through the hands of the writer, while the red-deer has only been found in seven; thus, contrary to what is generally assumed to be the case, the former animal predominated over the latter in numbers at the time the British bone-caverns were being filled.

If we pass from the caverns to the examination of the post-glacial river deposits we shall find the same numerical preponderance of the reindeer. It has been found by Mr. Trimmer along with the cave bear, *Elephas Antiquus*, and leptorhine rhinoceros, in the gravels of Brentford; by Mr. Leyton in a railway cutting at Kew-bridge; while from a gravel bed higher up the Thames at Windsor it furnished at least one-half of the remains found by Captain Luard, in the spring of 1867. In the gravels on which Oxford stands it is found in greatest abundance; at Bedford it is associated with flint implements, the red-deer, and the hippopotamus; at Lawford, near Rugby, with the cave hyæna; at Fisherton, near Salisbury, with the cave lion, urus, roe-deer, marmot, and lemming; in Kent also it is abundant in the brick earth of Sittingbourne and Maidstone; in Somerset in the gravels of the Avon, near Bath. Altogether it has been determined in ten out of eighteen river deposits which have furnished fossil mammals, while the red-deer has been found only in nine. The remains also of the latter animal, even where they do occur, are few and scant, while those of the reindeer are so abundant that their numbers can only be accounted for on the hypothesis that vast herds adopted certain routes in their annual migrations, and crossed the same rivers at the same points, just as they do at the present day in the northern regions.

(*To be continued.*)

LIVERPOOL VETERINARY MEDICAL ASSOCIATION.

The usual quarterly meeting of the above Association was held at the Medical Institution, Hope Street, Liverpool, on the evening of the 14th February.

Present: Messrs. G. Morgan, Spekeman, Harwood, Elam, and Akroyd, of Liverpool; T. Greaves, P. Taylor, Thomas Taylor, Nottage, and Gibson, Manchester; Wood, Wigan; Whittle, Worsley; Walley, West Derby; Naylor, Wakefield; Smith, Ormskirk; Storrar, Chester; Cartwright, Whitchurch; Dobie and Midgley, Birkenhead.

In the absence of the President, Mr. G. Hayes, Mr. Storrar, Vice-President, was unanimously elected to fill the vacant chair.

Mr. Morgan proposed Messrs. W. C. Lawson, Woolton, and J. Edwards, as members of the Association; the former having been seconded by *Mr. Greaves*, the latter by *Mr. Woods*, they were unanimously elected.

Messrs. Elam and *Midgley* nominated members.

Mr. Morgan moved a resolution, "That the meetings of the Association be held at six o'clock, instead of seven as heretofore," which, being seconded by *Mr. Greaves*, was adopted.

Mr. Whittle gave notice of motion to reduce the present annual subscription of one guinea to half-a-guinea; the entrance fee to remain the same.

Mr. Walley brought forward a proposition to publish the names of all the qualified veterinary surgeons in the counties of Lancashire and Cheshire in the leading provincial papers, in order to show gentlemen, and others, who really were members of the College, and who were not; the expense to be borne by the Association. After some little discussion, it was agreed to postpone the matter until the next meeting; the opinion of the members of the Lancashire Association to be taken in the meantime.

The Chairman then feelingly alluded to the great and irreparable loss sustained by the profession by the death of Mr. W. Litt, of Shrewsbury.

Mr. Cartwright followed up these remarks in a very feeling manner, and alluded to the kind character of the report of Mr. Litt's death in the *Shrewsbury Chronicle.*

Mr. Walley proposed that a letter of condolence be sent to Mrs. Litt in her affliction, signed by the President and Secretary on behalf of the Liverpool Veterinary Medical Association. *Mr. Greaves* having seconded the proposition, it was unanimously carried.

The Chairman then called upon Mr. Greaves to read his paper on "Professional Opinions Considered," with a view of placing them on a more satisfactory basis.

PROFESSIONAL OPINIONS ON THE SOUNDNESS OF HORSES, AND THE CUSTOM OF GIVING WARRANTIES.

As you will remember, I was enlisted through the dexterity of our worthy ex-secretary to undertake a continuation paper, or companion paper to the one brought before us at our last meeting, upon the soundness of horses, by my esteemed friend Mr. Peter Taylor; a paper which for good judgment, care, and patience in its compiling is worthy of our entire approval and confidence. Mr. Taylor completely exhausted that very interesting and important subject; he showed us most clearly and methodically in what manner an examination is to be made in order to ascertain whether a horse is sound or unsound, and how to arrive at correct conclusions in doubtful cases. If we carefully and closely follow those instructions we shall find it next to impossible to arrive at an incorrect conclusion. Having formed an opinion, let no dishonest or unworthy motive bias us, but let us give that opinion without fear, favor, or affection; and more than that, let us stand by it like men, unless we find that there is some just reason for us to alter the view we had taken. In such an event, I hold it to be the best policy, although it may be hard to submit to it in some cases, to at once admit ourselves at fault rather than unjustly and dishonestly continue a false position; and while upon this part of my subject, allow me to remark, if there is one thing upon which I desire to lay greater emphasis than any other, it is this, that no veterinary surgeon should allow his opinion to be tampered with in consideration of a fee.

I am quite free to admit that there are some few cases, as, for instance, a peculiar conformation of the hock, or a peculiar noise made in the respiration, resembling the normal quite as much as the abnormal sound, in which two practitioners of equal eminence in their profession, of equal practical knowledge and experience, and both giving expression to equally sincere and conscientious opinions, shall arrive at diametrically opposite conclusions,—it would appear there is scarcely anything more common than such cases. I have pondered over this problem often, and freely admit it is beyond my comprehension; in some cases it appears inexplicable how two opinions can be formed upon a question that looks tangible and self-evident; but so it is. I have to deal with the fact as it exists, and in my opinion will continue to exist so long as the minds of men are constituted as they are; therefore, if we cannot modify the natural prediliction of different minds, what else, I would ask, can be done in order to remedy this incongruous and extremely unsatisfactory state of things?—which so frequently entails a most grevious injustice upon the breeders of horses, so much so as to cause numbers of large farmers and breeders to give up breeding altogether, and even to ruin the honest and conscientious dealer in horses, while to the dishonest dealer there are opened wide the gates to fraud and imposition. To the veterinary profession there is scarcely any matter that

can be named that is of more vital consequence to its honour and its well-being.

Now, gentlemen, we are met together to-night to consider and discuss this question, and endeavour to ascertain what method can be adopted to obviate in future these vexatious and opposing opinions upon the soundness of horses. I look upon it as not only a fit and proper question for these associations to consider and discuss, but, if I rightly understand their aim and purpose, it is their bounden duty to take such questions seriously in hand, and, if possible, to define and settle them.

In the first place, I believe it is a fallacy to rely upon opinion at all in reference to the soundness or unsoundness of horses. Has it not been placed upon record by some of our ablest writers, and stated most emphatically by some of our best and most experienced living practitioners, that in numerous instances the opinions which they had advanced had proved to be totally wrong?

I would much rather remove the question of soundness or unsoundness entirely out of the domain of opinion altogether. It should not be left to the opinion of the veterinary surgeon, nor to the opinion of the men composing the jury, because both these classes of opinions, as you well know, have been proved over and over again to be as often wrong as right, and thus the truth and justice of the case are as often frustrated as attained.

Warranty.

The warranty of horses may be looked upon by some as a remedy for all evils; not so, however. We find that in giving a warranty, we are incurring great responsibility; and my esteemed friend, the late Mr. Litt, of Shrewsbury, in his paper read before the Veterinary Congress in London in May last, said, "I have long been of opinion that the law of warranty, as applied to the sale of horses, is one of the very worst laws upon the statute book of this country, and that if it could be repealed altogether, or so amended as to be deprived of its most vicious features, a great good would accrue to the public; an important branch of agriculture would be freed from an impediment which seriously threatens its annihilation; and the profession to which we belong would be relieved of one of the most serious obstacles, not only to its advancement as a science, but also, to the social position of its members." He, Mr. Litt, threw out two suggestions which he considered to be calculated to bring about this desirable end; but excellent though they are, I cannot help thinking that they are full of difficulty and objections. His first plan was, to enact a law defining patent and latent defects; the horse to be returnable upon the latter but not upon the former. He gives us no information as to who, or what tribunal shall decide the existence of either the patent or latent defects. If it is intended that such must be determined by a veterinary surgeon, or veterinary surgeons, I for one very much doubt whether such a law, for obvious reasons, would work. His, Mr. Litt's, second plan was, to limit the period during which a warranty should remain in force;

latent defects to render an animal returnable within three weeks, patent defects within three days. Here again the same difficulty confronts us, as in almost every instance opposite opinions would be given in respect to the disputed points. We are told by a writer (apparently a lawyer) in the 'Veterinary Gazette,' for June 5th, p. 215, "That there is no law relating to warranty of horses which does not apply to ordinary contracts for the purchase of anything else. All parties may contract as they please, and as it has become the custom to warrant a horse sound, the law puts the only construction upon the word which is possible, viz., by leaving it to a jury whether a horse was sound when sold." The same writer a little further on says, "I am at a loss to understand when the seller may do as he pleases, what more can be wanted." Now it is quite plain that the writer of the above article knew comparatively nothing about the difficulties with which breeders and dealers have to contend; it was altogether unnecessary for him to tell us that the breeder or dealer had the option to warrant his horse sound, or to decline to warrant him. But what we complain of is, the injury which the custom inflicts upon the breeder, and the detrimental influence which it exercises upon the production and sale of horses in this country.

Is not this evident in every horse-fair in England? Years ago every stable in the town in which a fair was held was full of horses, as well as the streets crowded: take Horncastle, Lincoln, Rugby, Howden, and Preston, and you will find that there are only scores now where formerly there were hundreds. You tell me the dealers sweep the country round about for weeks before the fair. This I admit, but these are the very men who will tell you of hundreds of large farmers who used to breed ten or twelve colts annually, now only breed two or three. This, gentlemen, is tracing effect to its cause.

Special Warranties

Are equally objectionable, as being a very fruitful source of disputes, frauds, and lawsuits. The warranty may have been given for one or three months, and before the expiration of that time the purchaser may desire to return the horse: the seller, however, refuses to receive him, advancing, as his reason, that the animal is so much worse in condition; perhaps he has suffered some injury—chipped a knee—got a saddle- or collar-gall, or a cough; and thus the special warranty is rendered of no effect.

Conclusion.

After having surveyed the various and admitted evils resulting from giving warranties on the soundness of horses, and with a view to their avoidance in future, I would suggest that the various veterinary medical associations in England and Scotland, together with other members of the professions, the various chambers of agriculture, and agricultural associations, should jointly endeavour to get a special law enacted, to the effect that no warranty of horses of any kind should be legal; that in all purchases of horses, geldings, and

mares, the purchaser should use all care and diligence to ascertain the character, quality, and fitness of the animal he is about to purchase; if his knowledge of such things is not such as to enable him to place confidence in his own judgment, he should obtain the assistance of a friend or a veterinary surgeon; then, if he decides to purchase, the bargain should be final and binding. It is possible there might occur some few instances of hardship; but it would be only those wherein proper care and precaution had not been exercised. I could advance many arguments in favour of this plan: I could show how it would be in many ways far preferable to the plan now in practice. The custom of giving a warranty being abolished, the seller or breeder would be able to demand the legitimate price of his horse, without being obliged to render himself liable to all the vexatious and expensive consequences often entailed in giving a warranty.

It is known to be a fact—and it is so naturally—that the breeder and seller always feel they have a right to ask a higher price when warranty is given.

With regard to the veterinary surgeon, it must follow that his services would be more in request than now; his opinion and advice would be sought for in almost every purchase. Surely, this will not be held as a fatal objection to the plan. I grant you, there would be greater responsibility and importance attached to the veterinary surgeon's opinion; and it would behove him to be more careful, if possible, than before, and use good judgment in ascertaining, not only soundness, but usefulness, fitness, &c.; but to devote more time to the examination. Possibly a higher fee would be required. Do you tell me that the veterinary surgeon would be held responsible for results? I cannot see that this would render him one whit more responsible for his opinion than he is now. If, however, the altered circumstances which I have endeavoured to sketch out in the preceding pages should be thought to involve the veterinary surgeon in any pecuniary responsibility, it could be easily remedied by having printed upon his certificate—"This opinion is given to the best of my knowledge and belief; but I do not hold myself pecuniarily responsible for such opinion, or the consequence of such opinion."

With a view of eliciting opinions upon this subject, I wrote to my friend Mr. Litt, inviting him to be present on this occasion, or to write me fully upon the matter; but, sad to relate, instead of this, I received the lamentable intelligence that he had been taken from amongst us. He died last Monday night.

I also wrote the following letter to Messrs. Lock and Maclaurin, the legal advisers of the Royal College of Veterinary Surgeons, who have taken the opinion of counsel upon the question. Mr. Lloyd is not only an eminent counsel, but one who has a very large parliamentary experience. His opinion is also attached.

MANCHESTER; *January 20th*, 1868.

GENTLEMEN,—The subject of professional opinions on the soundness of horses, and the custom of giving warranties with horses at

the time of sale, is a question much agitated amongst breeders, dealers, and veterinary surgeons, in consequence of the very unsatisfactory results arising, giving numerous opportunities for dishonest practices and complicated actions at law; the breeder or dealer cannot get the fair and legitimate value for his horse if he refuses to give a warranty; and if he does give a warranty, however sound the horse may be, he renders himself liable to numerous impositions and disputes. If the dispute is referred to the professional opinion of veterinary surgeons, however eminent and experienced these veterinary surgeons may be, it is nearly always found that no two of them are in accord in the conclusions they may come to; and it therefore follows, as a result, that juries decide as often wrong as right. Such being the case, it is becoming daily more and more to be desired that some change should be made in the law, and you, as legal advisers to the Royal College of Veterinary Surgeons, are requested to give the subject your attentive consideration; and I shall be glad to have your views and opinion upon the subject by the end of this month, or not later than the 10th of next. Of course your fee will be willingly paid by me. Can a horse, gelding, or mare be considered an exceptional commodity, and be removed out of the category of all other things? Abolish by law the custom of warranty altogether, make it illegal to warrant; render the bargain, after due trial and examination, when once completed final and binding upon both the vendor and the vendee, without power of appeal,—would it be necessary for this purpose to obtain a Bill or an Act? if so, should it be a public or a private Bill? What would be the probable cost? The above subject has to be brought before the Liverpool Veterinary Medical Association at the beginning of next month. Your early and careful attention and reply will oblige.

I remain,
Gentlemen,
Yours very truly,
THOMAS GREAVES.

Messrs. Loch and Maclaurin, Solicitors,
London.

8, GREAT GEORGE STREET, WESTMINSTER, S.W.;
January 31*st*, 1868.

DEAR SIR,—We are favoured with your letter of the 29th instant.

The subject to which you refer is one of very considerable importance and difficulty. Any alteration of the law affecting it can, of course, only be made by means of a public Act; and the law officers of the Crown would, previous to the introduction of the measure, have to be communicated with.

We confess, however, that it is scarcely to be hoped that Parliament would legislate exceptionally on horses and the dealings connected with them. At least, as at present advised, we do not see any reasons of sufficient weight that would, in our opinion, induce the Legislature to interpose and alter the general law on this par-

ticular point. At the same time, should you think it worth while to try, we shall be happy to do our best; but, in that event, we would strongly advise, as a preliminary step, that we should be authorised to obtain the opinion of an able counsel, such as Mr. Lloyd, who combines great knowledge of law with extensive Parliamentary experience.

We shall be glad to hear from you in reply to this; and should you approve of our suggestion, we will endeavour to obtain the opinion of counsel before the time you mention — the 10th of February.

We are,
Yours truly,
LOCH AND MACLAURIN.

Thomas Greaves, Esq., Veterinary Establishment,
Knott Mill, Manchester.

8, GREAT GEORGE STREET, WESTMINSTER, S.W.;
February 13*th*, 1868.

DEAR SIR,—We have had an interview with Mr. Lloyd this afternoon. He does not think that there would be any chance of passing a Bill carrying the matter as far as the total abolition of warranty, and making the opinion of a properly qualified veterinary surgeon final between the seller and purchaser without appeal. This would be such an alteration of the general law that he does not think Parliament would sanction it. Though the question can scarcely be considered as a public one, Mr. Lloyd thought that the abuses and scandals attending the present system were such that Parliament would be disposed to look favorably on any well-considered scheme introduced for their abatement.

He did not see what could be effected of a satisfactory character without the intervention of the Legislature. A number of influential men might, perhaps, combine and agree not to sanction the practice, as far as they were concerned; but this would not, of course, bind others; and they would soon fall back into their old ways.

Mr. Lloyd said that he would let us have his written opinion to-morrow.

We are,
Yours truly,
LOCH AND MACLAURIN.

Thomas Greaves, Esq.,
Knott Mill, Manchester.

CASE FOR THE OPINION OF MR. LLOYD.

THE law with reference to the warranty of horses is very generally considered to be in an unsatisfactory state, and the custom itself of granting warranties is much impugned amongst breeders, dealers, and veterinary surgeons. It has been found in practice that in many cases unsatisfactory results flow from it, affording as

it does numerous opportunities for dishonest practices, and resulting in expensive and complicated actions at law. Owing to the prevalence of the custom, the breeder or dealer is obliged to do as his neighbours do, and to warrant his horses, if he wishes to secure for himself their fair value; while the consequence frequently is, that notwithstanding the soundness of the animals at the time of the warranty, he is exposed to numerous impositions, and liable to be involved in dispute and, perhaps, litigation. For instance, it is a common practice for breeders in the country to be asked to warrant a horse without any previous examination. Rather than run the risk of such an examination, and to secure the full price, they comply and trust to fortune. If such horse when brought up to London, or other markets, sells well, nothing further is said. But if there is a difficulty in disposing of him, the purchaser has him examined by a veterinary surgeon; faults or imperfections are readily discovered, and the horse is returned to the breeder, who may find it impossible to prove before a jury (what nevertheless may be perfectly true), that the fault or imperfection complained of arose subsequently to the sale. As there is no limit in point of time to the effect of a warranty the breeder is never safe.

This being so, it has been much and anxiously discussed among those most interested in the question as to whether and in what manner the law on the subject could be changed?

Your opinion is therefore requested—

1. Whether you think an act could be obtained abolishing altogether the custom or practice of warranty with reference to horses, and directing that parties (aiming at having other protection than that afforded by the general law which governs contracts) must obtain the opinion of a properly qualified veterinary surgeon, whose decision should bind both vendor and purchaser?
2. If you think such an act hopeless of attainment, what steps can and should be taken to obviate, as far as possible, the evils which at present exist from the custom of warranting horses, and from its consequences?

There is so great an indisposition in this country to any interference by legislative enactment with the freedom of contract, that any departure from the rule would only be permitted in some exceptional case, and to remedy an acknowledged evil. Whether the abuses connected with the warranty of horses and the vexatious and unsatisfactory litigation so frequently arising therefrom, would be deemed a sufficient ground for restrictive legislation in this particular matter, is a question upon which I can give no decided opinion. But I think it would be well before introducing a bill for that purpose into the House, the draft of the proposed measure should be submitted to the law officers of the Crown, and their opinion be taken as to the expediency of presenting it. The evil and the scandal attending contested warranties are, no doubt,

notorious, and it is therefore not impossible that a well considered act for remedying them might find favour. I do not, however, approve of the alteration suggested in this query, nor do I think it would have any chance of being adopted. Express warranties, if the seller choose to give them, cannot be abolished. But something might, perhaps, be done towards assimilating the law in this country, as to warranty of horses, to the French law. In that country, by an act passed 30th May, 1838, the provisions of the Code Civil (1691) were modified. By the code, every sale carries with it an implied warranty against latent defects in the thing sold, which render it unfit for the purpose to which it is destined, or so far lessen its fitness that the buyer, if he had known them, would either not have bought or would have given a less price; and in virtue of this warrant the buyer may often return the commodity within a reasonable time, having back the purchase money, or claim damages in a reduction of price.

And by the law of the 30th May, the faults which entitle the buyer to avail himself of the warranty so implied in the case of horses sold are specified, and other special provisions are introduced which regulate with great exactness and particularity the rights and obligations of the seller and buyer, and the periods within which they may be enforced. And it appears to me that those provisions are very good, and might be introduced with great advantage into our law.

The text of them will be found at p. 481, of the Code Napoleon. Edition 1854.

2. I do not see that anything effectual can be done in changing the present system and practice of warranty without the aid of the legislature.

18*th February*, 1868. J. H. Lloyd.

After the reading of the paper a discussion was commenced, which was joined in by nearly all present, and carried on in a spirited and satisfactory manner until the meeting broke up. Each speaker acknowledged the excellence of the matter contained in the paper, and also the vast importance of the questions considered to the profession, and the owners of horses generally, and at its close Mr. Greaves was cordially thanked for his exertions.

Mr. P. Taylor, being called upon to make a few remarks on the subject, said he was disappointed that Mr. Greaves had laid stress upon the question of warranty rather than upon an understanding amongst veterinary surgeons as to what constituted soundness or unsoundness in horses. He did not understand why there should be so much difference of opinion amongst members of a learned profession, and said it was much to be regretted, and at times was a great scandal to the profession. The subject was very important, and if rules to guard the examination of horses could be laid down they would be productive of much good. Veterinary surgeons in their examination of horses should be honest, candid, firm, and prudent, as also in their studies of nature, in order to ascertain the results of

disease, and whether or not they had exercised too much discrimination at the time of their examination. If the law of warranty was to be abolished, the seller could still warrant if he chose, and the buyer would have the law in his own hands. He recommended that the owners of horses should sell them at a proper value, and give no warranty.

Mr. Gibson did not agree with Mr. Taylor with regard to raising a standard of opinion for the minds of professional men—men cannot be coerced into thinking alike upon any subject. Veterinary surgeons should always give their opinions candidly and honestly, and they need not fear anything. He strongly condemned the practice of guessing in a court of justice as to how long disease had existed; the guess generally was a few days previous to the date of purchase. He thought the law of warranty was pernicious, and that the question should be considered in a commercial point of view, as the horse may die before warranty has expired, and in many instances the dealer is held responsible. The same rule, he said, would apply to special warranties. Veterinary surgeons should take longer to examine horses than they do at the present time, in order to detect the tricks of dealers, as they could sometimes deceive any one; but he thought they would not try it a second time if they were once exposed. Dealers would be more careful in their purchases at fairs, and matters would find their own level.

Mr. Morgan thought that the law of warranty should be abolished, as it raised the price of horses fallaciously. Its abolition would cause breeders and sellers of horses to be more careful both in breeding and selling. If the purchaser chose to pay a large price for a horse that was warranted, and the seller accepted it, it would be on his own responsibility. Horses are not warranted in Ireland. With regard to special warranties, he thought them useless, as a seller could render them null by refusing to take a horse back, by the excuse that he had had his tail cut, had suffered from a cold, had kis knees marked, &c. He agreed with Mr. Gibson's suggestion that veterinary surgeons should take longer time to examine a horse, and should raise the fee in proportion. He thought the abolition of the law of warranty would be productive of as much good to the farmer as the abolition of the corn laws was.

Mr. Naylor said it was a custom amongst breeders to sell their horses at from two and a half to three years old, when their wind could not be well tested; they thus fell into the hands of breakers or graziers, who disposed of them to dealers, and warranted them. He acknowledged that the differences of opinion amongst veterinary surgeons were very lamentable, and condemned the partizanship of other persons with dealers, as the latter could make them say what they wished. A horse, he said, may have thick hocks without being unsound. The position of the enlargement should always be a criterion; also age of animal should be taken into account. If an enlargement should exist on the outer surface of the astragalus it might never cause lameness, though a dishonest dealer might use it as a means to return a horse, if he did not suit his purpose. He

thought that if a spavin existed anteriorly veterinary surgeons should determine to reject it. As to roaring and whistling a great difference of opinion existed, and he instanced one case where a horse became a whistler in a very short space of time. He said hundreds of horses became roarers, though not turned out to grass, from improper and gross feeding, and young horses should not be fed on very succulent food. He accounted for the differences of opinion amongst veterinary surgeons on the point by the different modes of examination adopted, as sometimes a horse would whistle in a gentle canter when no greater amount of pace would produce it. He suggested that in such disputed cases, the veterinary surgeons on each side should meet and examine the subject of dispute together on two or three separate occasions if possible. He strongly urged the advisability of keeping out of court all disputed cases. He also alluded to the fact of colts sometimes having one foot naturally smaller than the other, the small foot always being deeper in the heel. He should not reject such an animal unless the deformity was the product of disease.

Mr. Cartwright said he could not agree with the statements that had been made by Mr. Greaves and the late Mr. Litt, to the effect that farmers had ceased breeding horses; stating that he could see no diminution in the number of horses bred in his own district; neither did disputed cases of warranty often occur there, because farmers, as a rule, would not warrant their horses, and the buyer takes the opinion of a veterinary surgeon. He thought the dealers were to blame for so much litigation, as, if possible, they would obtain warranties, and then act dishonestly, and the seller is often glad to sacrifice a trifle to avoid trouble. He advocated no warranty.

Mr. P. Taylor asked Mr. Naylor what he would feed young horses and hunters on, if succulent foods had a tendency to produce whistling? In reply *Mr. Naylor* said he should only allow full grown or ripe grasses, or rye-grass with hay, although paralysis might sometimes be expected from the use of the rye-grasses. Horses grazed on old clover roots or lay grass were not so susceptible to roaring. Coach horses he considered most liable to the disease of whistling, which fact had induced many breeders to give up breeding them. It had passed into a proverb that King George IV was the cause of more horses roaring than any other man, from his great liking to big horses.

Mr. Greaves mentioned the fact, as described at the Yorkshire Association, of a horse becoming a roarer immediately from being thrown over into a ditch and having his head doubled under him. The owner of the horse, Mr. Ellis, was of opinion that the recurrent nerve having become strained produced paralysis of the muscles.

Mr. Gibson asked if in this case the roaring might not have been caused by fracture of one or more of the rings of the trachea? as he had known a case where a horse had been cast, and fractured four rings of that organ.

Mr. P. Taylor again called attention to the law of warranty, which he thought would still exist in spite of anything; he would advise that

no warranty be given. He thought in a case of disputed warranty, the question should he asked, how long would it take to produce the disease? not how long had it been in existence? Veterinary surgeons should always try to settle disputes between parties.

Mr. Morgan said he had divided the recurrent nerves of horses, and produced roaring instantaneously.

The Chairman said that as it was time for him to depart he would just make a few remarks on the paper and discussion; he had derived much pleasure and instruction from both. A veterinary surgeon should always protect his own honour, and not give dealers any power over him, as it lowered him in the eyes of all, and ultimately in his own. He should not sell his opinion, as he was not like a lawyer paid for carrying a bad case through by any means in his power. He thought it a fallacy for any person to warrant a horse. Let both buyers and sellers take the opinion of qualified veterinary surgeons. In Cheshire breeders seldom warranted unless they wished to get a high price for an unsound animal, when they would run the risk. Sometimes they were bitten.

Mr. Morgan was then voted to the chair,

Mr. Dobie asked if Mr. Taylor had mentioned in his essay the necessity of feeling the pulse of a horse when examining him, as he had sometimes discovered cases of intermittent pulse, and wished to know if it would be considered as unsoundness?

In answer *Mr. Greaves* said it was an interesting question, although he had never made a practice of examining the pulse. He should not pass such an animal as sound. Such a horse might work for many years, and still show no external signs of ill health. He considered it would be impossible to raise professional opinions to one standard, but if the law of warranty could be done away with so much the better. Patent defects there could be no difference of opinion about.

Mr. Elam corroborated Mr. Dobie's case of intermittent pulse. He considered the law of warranty was pernicious in its effects. It cannot be looked upon as a commercial matter, as in business the sample always determined the quality of the bulk. He referred to the case of the horse belonging to the Liverpool Omnibus Company, and stated that the said animal had been at work ever since the trial, and had remained perfectly sound. He thought veterinary surgeons would do well to study nature, and always give an honest opinion in examinations.

Mr. Walley said he thought that taking the law of warranty on the whole it was decidedly bad, as a man may sell a horse that he had never had the slightest reason to believe unsound, and yet in a month or two after he is sued for damages, the horse having died from a calculus or tumour of some kind, which it is said must have been in existence at the time of sale, although the animal may not have given any evidence of its presence. Again, buyers are often imposed upon by persons disposing of animals suffering from some intermittent or periodical disease as sound ones. He thought some provision should be made against injustice in each of these

cases, and suggested that some united and general measure should be adopted by the profession to bring the matter before Parliament, and get the anomaly done away with. Those diseases which he thought the seller should be protected against were calculi, internal tumours, of whatever class, diseases of bladder, kidneys, or ureters, internal abscesses, aneurism, mesenteric disease, &c., provided always that it could be proved that the seller had seen no symptoms indicative of such diseases, and *vice versa*, the buyer should be protected against intermittent lameness, as rheumatism, &c., periodical ophthalmia, megrims, spasm of diaphragm, glottis or velum palati, palpitation of the heart, intermittent attacks of gripes, worms, stricture of the neck of the bladder, &c. Patent defects he thought should not be interfered with, as a veterinary surgeon would always detect their existence.

After some discussion, *Mr. Greaves* dissenting from such a proposition; *Mr. Cartwright* and *Mr. Naylor* holding with it, the latter mentioning the cases of passing gall-stones producing pain and death should be included under the first head where the seller had not observed any passing from the animal whilst in his possession,

It was proposed that a recommendation be given to other Associations to thoroughly sift the matter, and, if possible, come to some definite conclusion. The meeting also wished it to be placed on record, that although a committee had been appointed at the late Congress to inquire into the matter, nothing had as yet been heard of their operations.

A vote of thanks, proposed by *Mr. Dobie*, seconded by *Mr. Morgan*, to Mr Greaves was unanimously carried.

The proceedings throughout were of a friendly and animated nature, the only drawback being the absence of the President, and the paucity of attendance of the Liverpool members. It could not be said that this reflected much credit upon their zeal for the advancement and good of the profession to which they belonged, and by the exercise of which they obtain their livelihood, while it gave little encouragement to gentlemen to come from a distance, when they found themselves thus slighted. A hope was expressed by all present that they would attend better in the future.

THOMAS WALLEY, *Hon. Sec.*

THE LANCASHIRE VETERINARY MEDICAL ASSOCIATION.

CONVERSAZIONE.

THE fifth annual meeting of the Lancashire Veterinary Association was held at the Trevelyan Hotel, Corporation Street, Manchester, February 19th, 1868.

The chair was occupied by the President, Thomas Taylor, Esq.; and the other gentlemen present were, Messrs. T. Greaves, J. Lawson, P. Taylor, George Browne, A. L. Gibson, J. Howell, A. Lawson, George Morgan, J. Taylor, William Lobie, W. A. Cartwright, W. Wood, W. Whittle, W. Haycock, L. L. Buckley, W. A. Taylor, J. Stoviar, T. Walley, C. Nottage, and S. W. Wilson.

The President delivered his inaugural address, in the course of which he treated of some of the most important topics that are engaging the attention of us as a profession at the present time. The first subject he adverted to was the proposed charter; but upon that matter he stated he did not intend to enter fully, as he was satisfied it was in the hands of those who were well qualified to deal with it; but he was fully convinced that if a man is competent, honest, and industrious, let him graduate from where he will, he could not help but make friends, even should they belong to a rival creed or college.

He then spoke of the Mutual, Benevolent, and Defence Society, which he regarded as the best institution ever founded by the profession. He gave Mr. George Morgan his sincere thanks for his exertions in advancing its interests, for he believed the success of the society was due to him; and he felt sure, in awarding to him the meed of praise, he was giving utterance to the sentiments of the association. He thought it would be the commencement of a new era in the profession, and tend very much to raise our social status, were it imperative that every one who presented himself for admittance at our various colleges should have satisfactorily served a term of apprenticeship to a properly qualified veterinary surgeon. By so doing we should get a better qualified and practical veterinary surgeon, and who, when he commenced to practise, would be an honour to the profession, instead of, as in many instances, a disgrace to the college from which he graduated. He made many other remarks, of a very able character, in reference to the education of the pupils, and concluded by assuring the meeting of his willingness to do all in his power to improve the position of the profession.

On the motion of *Mr. Howell*, seconded by *Mr. Lawson*, a vote of thanks was passed to the President for his address.

The company then partook of tea, after which dessert was served. The success of the various institutions in connection with the profession was proposed; and although the speakers did not take the same view of the subject, yet it was universally admitted that a great reform was required in the various colleges. Most of the gentlemen who addressed the meeting expressed their belief that the dawning of a brighter day was at hand, which would tend to raise the social, moral, and intellectual status of the profession.

The subjoined copies of letters of condolence were read:

"To Mrs. Litt.

"Madam,—At the fifth annual meeting of the Lancashire Veterinary Medical Association, held at the Trevelyan Hotel, Corporation

Street, Manchester, on the evening of Wednesday, 19th February, 1868, the President, Thomas Taylor, Esq., V.S., Manchester, in the chair, the following resolution was proposed by Thomas Greaves, Esq., V.S., Manchester, and seconded by W. A. Cartwright, V.S., Whitechurch, Salop, that 'a memorial, expressive of the deep sympathy of the members of the above Association, be transmitted by our President and Secretary to Mrs. Litt, upon the death of her husband, the late Mr. William Litt, V.S., Shrewsbury.'

"In accordance with the resolution, we beg, on behalf of the Association, to express our sympathy towards yourself and family on the sad bereavement you have experienced, and we desire to demonstrate in this public manner our high appreciation of your late husband's professional abilities, intellectual attainments, and social virtues. His death will be greatly lamented, not only by yourself, family, and friends, but by the profession at large, for whose advancement he laboured incessantly, especially with his pen. The numerous contributions he has thus made to veterinary science are so many monuments to his honour which time will not easily efface.

"T. Taylor, *President.*

"Geo. Browne, *Secretary.*"

"To Mrs. Hampson.

"Madam,—At the fifth annual meeting of the Lancashire Veterinary Medical Association, held at the Trevelyan Hotel, Corporation Street, Manchester, on Wednesday, the 19th February, 1868, the President, Thomas Taylor, Esq., V.S., Manchester, in the chair, the following resolution was proposed by Alexander Lawson, Esq., V.S., Bolton, and seconded by James Howell, Esq., V.S., Rochdale, that a memorial expressive of the deep sympathy of the association, be written and transmitted, by our President and Secretary, to Mrs. Hampson, upon the death of her husband, the late Roger Hampson, V.S., Bolton.

"In accordance with this resolution, we beg, on behalf of the Association, to express our deep sympathy towards you, in the severe loss you have sustained in the untimely death of your husband; and although a long life is not the *summum bonum* of our existence, yet we could have wished that his might have been spared to you and his friends for many years to come, and that he might long have adorned the profession of which he was so distinguished a member.

"Thomas Taylor, *President.*

"G. Browne, *Secretary.*"

The twenty-second quarterly meeting of the Association was held at the Royal Institution, Mosely Street, Manchester, on Wednesday, March 11th, 1868, the President, Thomas Taylor, Esq., V.S.,

Manchester, in the chair. The following gentlemen were present :— Messrs. John Lawson, T. Greaves, W. Haycock, W. Whittle, James Taylor, W. Taylor, E. Nuttall, C. Nottage, P. Taylor, W. A. Taylor, S. A. Taylor, and the Secretary.

The Secretary moved that the annual subscription be reduced to 10*s.*, seconded by *Mr. James Taylor.*—Carried.

Mr. Greaves proposed a donation of £50 to the Benevolent and Defence Society.

Mr. Haycock proposed that the matter be deferred until the next meeting, and that the members be advised by circulars; seconded by *Mr. Lawson.*

The President then called upon Mr. Haycock to read his essay upon "Glanders."

To say that the subject was treated by the author in an able manner would not be doing him justice; for it was a most practical and highly scientific paper. The matter was handled in such a manner as to leave an impression upon the minds of his hearers, which will be long retained by them. It is to be hoped that Mr. Haycock will give the profession the full benefit of this and his other able productions by publication.

Mr. Greaves, Mr. P. Taylor, Mr. Lawson, and other gentlemen, took part in the discussion; and, on the whole, a most harmonious and profitable evening was enjoyed by those who were privileged to attend the meeting.

G. Browne, *Secretary.*

WEST OF SCOTLAND VETERINARY MEDICAL ASSOCIATION.

The members of this Association met in the Bedford Hotel, Glasgow, on Wednesday, 11th March; Mr. Robinson in the chair.

The minutes of former meeting having been read, Mr. Anderson proposed that Mr. Robert Erskine, Glasgow, be admitted a member of this association. After being balloted for, he was admitted.

The chairman stated that there was nothing of any importance to state about the progress of the Scottish Charter, but thought that in a few weeks he would be able to state that it had been *granted.*

Several cases of importance having been related by the chairman, Professor Armatage, Principal Williams, and Mr. Anderson, the chairman stated that as Mr. M'Arthur was not present, he had requested Mr. James Anderson to read a communication which he had prepared, and which he thought would be interesting to the meeting.

Mr. Anderson proceeded as follows—

DISEASED LIVER, ASSOCIATED WITH RUPTURED STOMACH IN A HORSE.

In order to make this brief communication interesting, it will be necessary I should give the history of the animal from 1864 to the time of his death.

On 12th November, 1864, my father examined a hunter for Hugh Neilson, Esq., Glasgow, and while being galloped in order to test his wind, the animal was heard to breathe loudly. The circumstance made my father hesitate as to whether he should advise his client to purchase him or not; but on taking into consideration the excellent qualities which the animal possessed, he told Mr. Neilson that he might be risked.

The horse was therefore bought, and was hunted on the 17th. The following day he was seized with colic, and recovered under ordinary treatment. He was hunted during the rest of the season regularly, and gave great satisfaction. During the summer, however, he became a roarer without any apparent cause; but he could still do his work well, and did not get exhausted even in a very severe run. He had on several occasions since attacks of colic.

On the morning of the 14th February, 1868, after having been hunted the previous day, he became very unwell. We were sent for, and arrived at 6 a.m., when he presented the following symptoms.—Clammy perspiration all over the body, great excitement, pulse 66 per minute—accompanied with all the symptoms of colic. We did not think him alarmingly ill, however, until he was turned round in the stall for the purpose of administering a colic ball, when we noticed in his countenance a gazing, anxious expression, indicating that his disease was of a very serious nature. Medicine gave no relief. At 7 o'clock his pulse was 80 per minute, when I bled him, but still no mitigation of the pain followed. We had him removed at 8·30 to one of our own loose boxes, where we had a better opportunity of watching closely his progress. Here the symptoms he showed were very peculiar. He would stand at times with his feet drawn under abdomen; all four meeting so close as to touch each other; then he would turn round and round, perhaps as often as twenty times without stopping; continuing invariably the same course, viz., from right to left.

He very frequently pointed his muzzle to the region of the liver, as much as to say, "I feel pain here." At other times he would lie down and get up again quickly. Always in the act of lying, he rested for a minute with his knees on the ground before allowing the rest of his body to come down. Sometimes he would lie stretched out with head extended, and in rising again would recommence rotatory movements. At 12 o'clock we found him turning with his feet set more apart from each other. Pulse much worse. At 1 he pressed his hind quarters against a corner of the box, and lifted his hind legs in quick succession, at the same time hitting the crib with them. Immediately after leaving the corner, he alter-

nately turned his muzzle towards his right and left flanks. When I again saw him, at 3 p.m., he was going round but in a different manner from any of his previous turnings. He made his hind legs go first, and at the same time that he was turning, inclined to go slowly back. While watching this peculiar symptom, my father told me of a case which he had had during his first year in practice, which showed this backward movement very strikingly; and on opening the animal after death, he found a ruptured colon with contents escaped into the abdominal cavity. He remarked that very probably the same existed in this case.

Between 4 and 5 pulse was 100 beats per minute. At 8.30 frothy saliva issued from the mouth; his head went repeatedly up and down; pulse hardly perceptible; stood motionless, with tail elevated; died at 10 o'clock. Post-mortem appearances were as complicated as the symptoms; they were as follows :—

On laying open the abdomen, we found the liver of a clayish colour, and tinged with yellow. Its structure was very easily torn, and part of it adhered to the diaphragm. The musculer coat of the stomach was lacerated to the extent of 12 inches in length. The mucous coat of that organ was also ruptured, but only measured 3 inches in length. Omentum torn; also part of stomach contents had found their way to the pelvic cavity. Ecchymosed spots were seen on the external coat of ileum; peritoneum inflamed; contents of alimentary canal of a good soft consistence. On opening the thorax by removing the ribs, we found the lungs slightly congested, but they had no appearance of chronic disease. Four large and well-defined ecchymosed spots were situated on the external surface of left ventricle of heart. On tracing the recurrent nerve from the chest upwards, we found on coming to that part near to where the laryngeal branch is given off at the left side, a nodule of bone about the size of a small pea fixed on the sheath, which contains both artery and nerve. The nodule appeared to me to be a deposit on the coats of the artery, but from its disposition, it must have exercised pressure more or less on the nerve.

While dividing the dura mater, in order to remove the brain, I was astonished at finding an enormous quantity of fluid escape. After the brain was taken out, the part of the cavity remaining got completely filled, and ran over its edges. Apparently the source of the fluid was partly from the spinal canal. The subject possessed an extraordinary large and very healthy trachea. The larynx was also large, and appeared normal.

What induced me to write on this case was, because of the difficulty I felt in accounting for the series of peculiar symptoms, and how, after I had made the post-mortem examination, my mind was satisfied so far as to venture my opinion regarding some of the symptoms and their relation to the above lesions.

I am inclined to think that the loud breathing which was heard at the time of purchase, was not a symptom of disease, but only a sign indicating that the animal possessed the good property of being long-winded, or in other words, a "laster." He was known to be a

particularly long-winded horse, and as I said before, his respiratory organs were very healthy and extensive, admitting of an extraordinary quantity of air which would, I have no doubt, cause loud breathing. I ascribe the nodule of bone pressing on the nerve to be the cause of the roaring which came on during summer. The chronic diseased state of the liver, I regard as being the cause of the repeated attacks of colic. The pointing of his muzzle to the region of the liver, and the weak, quick pulse and clammy sweats indicated disease there. Probably the successive shifting of the hind legs indicated rupture of the muscular coat of the stomach. Probably the mucous coat was torn very shortly afterwards in the act of lying, as he was observed to come to the ground with a little force a short time after the shifting of the legs took place. It was immediately after he rose again that the peculiar symptom of going back was noticed, and when my father spoke of the former case which he had had of the contents of the colon having escaped into abdominal cavity. The serum which was formed in the brain cavity, perhaps would account for the state of stupor the animal was in shortly before death.

Professor Armatage kindly gave me his opinion regarding the serum in the brain. He says such a quantity might be secreted within a very short period, probably during one day.

ALBERT VETERINARY COLLEGE.

We have been requested to state that the winding-up of the Albert Veterinary College refers to the Limited Liability Company known by that name, and that the establishment is still kept open, both as a College and an Infirmary.

OBITUARY.

DEATH OF MR. O. W. G. BROWN.

It is with feelings of the deepest regret that we record the death by accident of Mr. O. W. G. Brown, Demonstrator of Anatomy at the Royal Veterinary College, which melancholy event took place on Tuesday afternoon, March 24th. Mr. Brown left his residence on horseback for the purpose, among other things, of visiting a patient at Hampstead, at the request of a professional friend; and was scarcely seated in the saddle when the animal dashed away at a pace which soon resisted all efforts to restrain. He had hardly run half a mile when, in attempting to avoid a cart and turn into a side street, he fell on his side, throwing poor Brown with great violence on the ground. Instant assistance was at hand, and he was picked up and carried to the nearest surgeon's in a state of insensibility. Other medical advice arrived, and he was forthwith conveyed to the house of the friend to whom the horse belonged. Here he only remained for a few hours before death resulted; his condition from the very first indicating that there was no hope of life being preserved, or returning consciousness taking place.

This sudden removal of one who, during his short professional career had won, as Demonstrator of Anatomy, the respect of every pupil, and the sincere friendship of his colleagues, has cast a deep gloom over the College and all connected with it. He was a young man of great promise; and no doubt, had he been spared, would have taken a lead in the profession he had chosen. This, however, was not permitted. In the flower of his youth, for he had only just entered the twenty-fifth year of his age, he was called hence to be no more seen, but yet to dwell in memories of all, to whom he had become endeared. His funeral, which took place at Kensal Green Cemetery on Monday last, March 30th, was attended by all the Professors of the College, and the entire body of the students.

DEATH OF MR. W. WATSON.

Death, the leveller of distinctions, for alike to him are the peasant and the prince, the learned and the unlearned, has also taken from among us one, the labours of whose pen have often enriched the pages of this journal, viz., Mr. Walker Watson, M.R.C.V.S., of Rugby, who died 2nd of March, 1868, aged thirty-four. His diploma bears date May 14th, 1857.

At an early age, Mr. Watson has been removed in the midst of seeming usefulness, and when the mind, it might have been hoped, stored with rich fruits of experience and observation, could have withdrawn therefrom much for the benefit of others. Nor was he slow to do this. Botany, in its application to veterinary medicine, was his favorite study; and had he lived, doubtless he would have continued his researches, and have thus added alike to his reputation and professional advancement. Of his abilities otherwise he gave proof in the edition edited by him of 'Youatt on the Horse.'

The designs of Providence are not only mysterious, but

> "Too deep to sound with mortal lines,
> Too dark to view with feeble sense."

And if, as Professor Rymer Jones has told us, "among the innumerable beings which crowd this world, not one is idle: all are actively employed, each in its separate sphere of usefulness; and though they blindly do the work imposed upon them by their Great Creator, ignorant of each other's ways, the grand result is harmony," surely man, the noblest animal in creation, has his allotted task to perform, and by co-operation to aid and assist his fellow man.

We may well feel no little regret at losing so many from among us, and those, too, who have been wont to take an active part in our onward progress; and while permitted to express our sorrow, we would at the same time express our hope that their places may be even better filled, if possible, by others. It is to the rising members of the profession we look, and we say to them—Let those who have gone before be your examples; by them be ye stimulated to buckle on the armour, and stand forth boldly in the fore-front of the battle for truth. 'Tis a noble warfare, and brings its own reward. These have only gone a little while before us; we are all travellers to eternity, from the cradle to the grave, and the great fact of life is death, Still it is both natural and right that we should mourn departed friends.

> "He that lacks time to mourn, lacks time to mend.
> Eternity mourns that. 'Tis an ill cure
> For life's worst ills to have no time to feel them.
> Where sorrow's held intrusive and turned out,
> There wisdom will not enter, nor true power,
> Nor aught that dignifies humanity."

ERRATA.

Page 183, line 3, *for* "in" *read* "or."
Page 183, line 18, *for* "more" *read* "mere."
Page 183, line 33, *for* "the" *read* "their."

THE

VETERINARIAN.

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DEATH OF PROFESSOR MORTON.

A PILLAR of the profession has fallen. Professor Morton is no more. Little did we think when, last month, we recorded the death of the youngest officer of the Royal Veterinary College, that ere another month had passed away, one who might not inaptly be called the oldest officer of the institution would also be numbered with the dead. Events of this kind are doubtless intended to impress the admonition "Be ye also ready" indelibly upon our minds. They bring home to us with a force of their own, both the shortness of life and the frailty of human nature.

For upwards of forty years the name of Morton has been associated with the science of veterinary medicine. On every occasion when advance was to be made, we find our departed colleague taking his place in the foremost rank, giving example to the oldest and encouragement to the youngest to press forward in the best interests of the profession. By far the largest portion of the present members of the profession were his pupils, and among them he had his dearest friends. No better proof can be afforded of his devotedness to our art than the circumstance that on the obtainment of the Charter of Incorporation he was the very first to present himself before the Court of Examiners as a candidate for the diploma of the Royal College of Veterinary Surgeons, that he might become *de facto* a member of that profession in which he had been for many years so distinguished a teacher.

Professor Morton was commonly believed to be a Devonshire man; he was, however, from circumstances connected with the early death of his mother, only reared and educated in that county. He was born in London in the year 1800, and when but three or four years old he removed with his parents to Honiton. In due time he was put apprentice, after the custom of the day, to a chemist and druggist at Tiverton. His master, Mr. Quick, was a person well calculated to store his pupil's mind with rich truths, and no doubt, both by his example and precept he tended to form that character so much admired in our deceased friend. His service ended he returned to London, and entered the house of a wholesale druggist in the City. Here he only remained for a short time, when he removed to the Veterinary College, taking office as clerk and dispenser. In this capacity he laid the foundation for his future fame, and commenced at his own expense a long series of experiments on the action of medicine on the lower animals. In 1828 he essayed to become a teacher, and delivered his first course of lectures on purgative, diuretic, and other medicinal agents to a few pupils of the college, among whom was the writer of this obituary. Year by year he pressed on, and as no instruction of this kind was afforded by the recognised teachers within the college, he soon joined the present principal of the Institution—Professor Spooner—in establishing an outside school of instruction. Here the two friends laboured together, until by force of circumstances, both saw themselves within the college walls as teachers of veterinary science, each in his own separate sphere; and here our colleague continued to work up to the time of his retirement from the professorship in 1860.

In 1837 he gave to the world his first literary production, 'A Manual of Pharmacy for the Students of Veterinary Medicine.' It was a small work of 188 pages, foolscap 8vo, and was dedicated to the late Professor Coleman, with whom he had always been on terms of the greatest friendship. To show the character of the man in all its genuineness and

ardour, we venture to quote the following remarks from the dedication :

"The science of Veterinary Medicine, released from the trammels by which it was so long confined, has advanced, and is advancing, under your fostering care. You saw its first disenthralment. Like a delicate plant it came forth. The soil around was arid, and chilling blasts threatened its destruction ; you shielded it with the mantle of science, and removed every noisome weed from around it. You carefully watched over and nurtured it ; it has grown and become strong. Rich fruit has already been yielded by it, and more is promised. All it now asks is, support from those it shelters, in order that it may maintain the position in which a discerning and an enlightened age has placed it.

"Respectfully would I here acknowledge how much to you I am indebted for valuable information derived during a long personal intercourse ; a favour which I trust I can and do appreciate."

This book supplied a long existing want, and the appreciation of the profession as to how this want was filled is shown by the circumstance that it has since passed through seven *editions,* and now numbers close upon 600 pages.

The publication of the manual was followed in 1840 by a 'Veterinary Toxicological Chart,' illustrated with coloured engravings of chemical deposits from poisonous solutions. This also was a valuable gift. It passed through two editions, when it was superseded by more elaborate productions.

In 1841, he undertook to edit the 'Transactions of the Veterinary Medical Association,' which had from the time of the foundation of the Association, in 1836, been published by the late Mr. Youatt, in conjunction with the *Veterinarian,* under the heading of the 'Proceedings of the Association.' After three years this work merged into the 'Veterinary Record,' of which Morton became editor in chief, although other names were associated with his. This periodical was published monthly, and it continued to make its wonted appearance for a period of six years.

Another work from his pen saw the light in 1844, entitled 'Calculous Concretions in the Horse, Ox, Sheep and Dog.' It was well written, contained a careful digest of the whole subject of urinary deposits, and was splendidly illustrated with coloured plates.

In 1855, in consequence of the death of the late Mr. W. Percivall, Professor Morton, jointly with one of ourselves, became the proprietor and editor of the *Veterinarian*. His support in conducting this journal has been to us invaluable, but alas, its pages will no longer be enriched by his pen. Our readers will miss his well-known and pleasing style of narrating facts and commenting on passing events. Poetry of words as well as a capability of enriching his subject by well-selected verse belonged to all his writings. In the opinion of some this occasionally deprived his observations of point and force, but it always gave to the man air of lightness and freedom well pleasing to the majority of our readers.

We pass to some other things connected with his history. In 1850 the members of the body corporate elected him on their representative Council, a post which he continued to hold up to 1860, when it was vacated by his retirement from active duty. In 1854 he was appointed treasurer to the college. The duties of this office he performed for four years, and at a time when just such a man was required to be the custodian of the college funds. In 1864 he was chosen to fill a vacancy in the Court of Examiners of the Royal College of Veterinary Surgeons, and took his place at the Chemical table, having as his colleagues, Dr. A. S. Taylor and the late Professor Brande.

In 1867 the Council elected him as its president, but this honorable distinction he felt compelled to decline in consequence of advancing age and impaired health. Here our account of his public life must end.

With regard to the man we have no fear of being accused of exceeding our duty when we say that by the kindness of his disposition, his honest friendship, and his ready charity to the poor, the needy, and the afflicted, Morton was endeared to all who knew him. Resting on the "Rock of Ages,"

his end was peace. Quietly, after only a day or two's illness, he passed away early on the morning of Saturday, April 4th, in the sixty-eighth year of his age.

"Death is the gate of endless joy,
And yet we dread to enter there."

On Thursday, April 9th, his body was laid in the same grave, beneath a spreading yew-tree, in Honiton Old Churchyard, where, fifty-eight years before, his beloved mother was interred. Their ashes mingle. May their spirits be united in the realms of eternal bliss!

Communications and Cases.

NOTES ON THE INFLUENCE OF ATMOSPHERIC PRESSURE AND ALTITUDE ON HEALTH AND DISEASE IN MAN AND LOWER ANIMALS.

By G. Fleming, F.R.G.S., &c., Royal Engineers.

The mass of thin, elastic, transparent fluid, which we generally designate as the *air* or *atmosphere*, and which envelopes the dense surface of our globe like a delicate film, reaching to a height of many miles, possesses various characters of great interest to the medical, no less than to the natural or chemical philosopher. For this immense gaseous ocean is indispensable to the existence of all living organisms, being the laboratory in which most of the chief operations of life are carried on, and on the composition of which they mainly depend for their due and thorough completion. Besides its *chemical* properties, which are of the utmost importance to the welfare of the present condition of our terrestrial sphere, it is endowed with others which are of no less moment, but which are termed its *physical* attributes, and it is the influence of one of these on the health of living creatures that we now purpose examining.

Though the atmosphere is invisible, except when in large masses under certain conditions, when it assumes a blue tint, and though it possesses neither taste or odour, yet it is a permanent gas or substance, claiming all the principal attributes of matter. For instance, it is impenetrable, compressible, dilatable, perfectly elastic; while dry it is a bad con-

ductor of heat and electricity, though when damp it readily transmits these, and its atoms are liable to be acted upon like those of other bodies by chemical action.

Though long supposed to have no appreciable ponderability, we owe to Galileo the discovery of its being a body possessing weight. Many simple experiments may be resorted to in order to exhibit this property of the air, but at present it may suffice to state that 100 cubic inches of this gaseous mixture, when very dry, and at the temperature of 60° barometrical pressure of 30 inches, weighs 30·5 grains, thus being, when compared with the weight of water, as 1 to 770.

As a consequence of this property of *ponderability*, the air surrounding us exerts a pressure on the whole surface of the globe which is proportionate to its weight; and owing to its elasticity, it occupies a space in direct ratio to the pressure it supports, in such a manner that its volume is one half less when this pressure is doubled. In this way it acts on the bodies with which it comes in contact with a force equal to its weight.

The density of the atmosphere will, then, be understood to be of particular importance in relation to the performance of vital acts, when we reflect that at the ordinary level of the sea a man of medium bulk and stature supports no less a burden than 32,343½ lbs., and all other animals in proportion to their superfices.

This weight of the atmosphere, in connection with climate, is the most remarkable for its elusion of direct observation when the use of instruments is not employed, and under ordinary conditions its effects are inappreciable, for the following reasons: Bodies equally compressed on the whole of their surface readily maintain their position, and whether at rest or in motion are not embarrassed by their load. But how is it, it may be asked, that such a load acting everywhere on the exterior of bodies does not squeeze them into a very small bulk, and inflict great injury on them? Simply because the external pressure is counterbalanced by the reaction from within, and that which takes place without is also at work internally—every membrane and fluid, every cavity contains this compressible elastic air, which maintains the equilibrium necessary for the due performance of their functions, and every part of the organized body, sustaining the same degree of pressure without and within, remains unaffected, on ordinary occasions, by the invisible load, of whose existence no one is usually aware, and whose variations are nearly always unnoticed, except by the meteorologist or speculative physician

who busies himself in such pursuits to discover, mayhap, the subtle causes of epidemic or endemic diseases.

Many familiar examples might be given of the effects of atmospheric pressure, but one well known to the comparative anatomist will here suffice. It has been fully demonstrated that the solidity of the coxo-femoral articulation is principally, if not entirely, due to the aërial fixture external to that joint. The ligamentous rim encircling the cotyloid cavity plays the part of a valve, and prevents the entrance of air, so that the head of the femur is maintained firmly, and in close apposition to the acetabulum, simply because the cavity is void of air. After death, and even when all the muscles surrounding the articulation have been removed, no displacement occurs, and the limb does not descend the smallest fraction of an inch; but let the minutest opening be made, and without interfering with either the capsule or the *ligamentum teres*, if so be that the subtle fluid obtains admission, the member at once descends, and the ball hangs pendulous within the cotyloid socket. M. Guerin* has also experimentally proved that not only is the contentive influence of this pressure common to all the arthrodial articulations, but that the articular and serous cavities, periodically or temporarily, manifest enlargement of their dimensions, causing in these cavities a tendency to vacuity, and consequently, through atmospheric force, exerting a notable influence on the exhalations in their interiors.

Though in ordinary conditions this gravitation or pressure of our invisible ocean causes no inconvenience, yet when living creatures are subjected to great and particularly sudden variations in this respect, the results are often injurious. An inch fall or rise in the barometer indicates that the load is diminished or increased to, in the case of man, somewhere about 1000 lbs.; and when this burden is augmented or increased to a greater degree, within a brief space of time a corresponding and abnormal effect must be produced on the beings subjected to these changes.

It is worthy of notice that the barometrical variations are due to various causes, but that the chief one is air pressure; and that there is a regular series of diurnal changes of a very marked kind. This daily variation is such that the maximum is attained between nine and ten o'clock in the morning, then it descends till three or four o'clock, when it reaches its first minimum, and at ten o'clock in the evening it rises again to its second maximum, falling to its second

* Guerin, 'Mémoire sur l'Intervention de la Pression Atmosphérique dans le Mécanisme des Exhalations Séreuse.' Paris, 1840.

minimum at three or four in the morning. Of course, these variations differ in intensity, according to latitude, &c.

It has often been asked if these diurnal changes in the weight of the atmosphere have not some influence on the law of births and deaths, as the majority of these events occur between midnight and six o'clock in the morning;* with regard to the cattle plague, it would appear to be an ascertained fact, that the largest number of deaths took place after midnight and towards morning.

At ordinary levels, when the barometer is very low, people often feel uneasy, especially when the change has been sudden; but this will be more fully noticed hereafter. When the mercury has risen very high, pathologists have asserted that internal congestions of the mucous membranes are not unfrequent.

Rychner declares that horses affected with asthma (*vulgo*, "broken wind") respire with more difficulty under a strong atmospheric pressure, and that convalescence from pneumonia is longer in taking place.† Prout thought that the specific gravity of the air was not always the same, and that during the cholera in London in 1831 it had considerably increased.‡ Later observers, however, and amongst them Davy, have not been able to verify this statement.

According to the observations of M. Magne,§ it may be said that the density of animals is always in relation with atmospheric pressure. If this increases, the blood, lymph, and the gases contained in organs become more and more compressed and dense; if it is diminished, these fluids tend to expand, and become more rare, thus reacting more strongly on the solids enclosing them. The augmentation of density is, however, generally favorable to health: animals submitted to an increased pressure of the air are active, strong, and all their functions are perfectly performed. Respiration is easy, inspiration is performed with facility, and the contractions of the heart are slow, but regular; the air contains, in a given volume, much more oxygen, and the necessary chemical changes in the blood are accomplished with facility, while that fluid is stimulating and rich in alible principles; so that nutrition is active, the tissues assimilate abundance of materials for their increase, the flesh becomes firm and atonic, as well as organic lesions disappear.

* Quetlet, 'Sur l'Homme,' vol. i, p. 102.
† Hensinger, 'Pathologie Comparée.'
‡ Prout, 'Chemistry, Meteorology,' &c., p. 353.
§ Magne, 'Nouveau Dictionnaire de Méd., &c., Vétérinaires,' vol. i, p. 288.

At the same time that the acts of nutrition are accelerated, all the vital functions become more extended and developed.

If this increase in the density of the air passes beyond certain limits, however, and in too sudden a manner, serious accidents may ensue, as has been already remarked. We have evidence of this in the case of the diver, who, in the diving-bell, descends very rapidly to a great depth in the sea; he experiences pains in the ears, which cease as soon as his descent is accomplished. These pains are due to the sudden expansion of the air within the tympanum, which consequently has not now an equal density with that within the diving-bell, and the fluid filling the external canals of the ear pressing on the auditory membrane unduly stretches it, thus giving rise to pain. The diver, however, usually evades this discomfort by descending slowly, and stopping two or three times, in order to permit the external and internal conditions of his body to adapt themselves to each other.

The atmosphere does not always exercise hygienic effects in proportion to its density. The air of mountains, though light, produces on animals, through its freshness and purity, the same effect as the more concentrated air of the plains; it contains in an equal volume as much oxygen, and is as favorable to health; while in low-lying places the influence of an elevated temperature, and a greater amount of watery and other vapours, detract from the good effects of density.

When the pressure of the atmosphere is suddenly diminished, its salutary action on organized creatures in ordinary conditions is sufficiently palpable; the effects which are then produced show that health could not be maintained without this property. Some animals which live in the sea have a much softer consistence than terrestrial creatures, and they cannot thrive or swim unless pressed upon on all sides by a more resisting fluid than the weight of the air. When these creatures are withdrawn from their native element, their bodies soon become disorganized. And there are fishes which, although firmer in texture, being accustomed to live at greater depths in the ocean, where they move with the greatest ease, and support a pressure of about eighty atmospheres, will yet die when brought to the surface; their fluids dilate, the swimming-bladder becomes enormously distended, their viscera protrude by the natural openings, and the skin even rends by the sudden expansion of the internal structures.

Creatures inhabiting the surface of the earth are less markedly affected by a diminution of aërial pressure, their fluids being less dense than those of fishes; but when the pres-

sure is artificially reduced, as in ascending high mountains, or by a balloon, similar phenomena are noticed. The body swells, the internal fluids distend the tissues outwards, press strongly upon them, rupture vessels, and often produce hæmorrhages.

A rarified atmosphere contains in a given volume less oxygen, so that respiration, being completely performed, becomes accelerated to make up for this diminution; the inspirations are proportionately multiplied, the heart contracts more energetically and frequently; the blood circulates with difficulty, the lungs become engorged, and the blood-vessels are so distended that aneurisms are often formed.

As the air becomes light, our sensations would lead us to believe that it is heavier, simply because it sustains us in a less degree than usual, and because our blood is less perfectly oxygenated. It is common to say that the air is heavy when it is hot and damp, although it then weighs less than in the opposite condition, in consequence of its affording less support to the various organs and inducing a weakened state of the circulation, which seems to be attributable to the weight of the atmosphere.

As we ascend through the various strata of this vast aërial ocean, the humidity which forms an important feature in its composition in the lower regions rapidly disappears; so that the atmosphere of the higher altitudes is nearly always very dry, and having a great affinity for water, desiccates the skin and the mucous membranes, and produces most unpleasant sensations.

Of course the way in which the variations in the density of the atmosphere is brought about will also have a great influence on the effects which these variations determine. An animal may live when gradually transported to a very great altitude, and yet would instantaneously perish if subjected under the air-pump to the same degree of aërial rarefaction.

In relation with altitude, temperature is closely connected, but as this will form a subject for inquiry hereafter, it may be only necessary at present to state that a temperate heat is most favorable to the health of the majority of the domesticated animals, but particularly those of a lymphatic temperament. A hot air cannot be said to be salutary to many of the creatures useful to man, inasmuch as it operates in a similar manner to an atmosphere that has lost much of its density.

The influence of altitude, then, in the maintenance of health or the production of disease in various organized

beings has some analogy to the effects of climate; but inasmuch as some of these effects differ, and as there are many phenomena apparent at various altitudes which are not observed during the transition from one climate to another (using the term "climate" in its ordinary acceptation), and as the subject of altitude possesses much that is interesting to the comparative pathologist, I will bring together an amount of evidence from various sources which may tend to illustrate and enlarge what has just been briefly referred to. I do this the more readily because from what has been said in a recent medical work,* it would appear that doubts are yet entertained as to the operation of altitude in the production of disease in the lower animals; doubts which I think are quite unreasonable, after the varied and convincing evidence we possess.

This evidence refers to the descriptions given by travellers and others of ascents into the mountainous regions of the four quarters of the globe, as well as the observations of men who have made the subject of altitude a somewhat special study, when treating of meteorology and other natural phenomena. From their testimony it may be laid down as a rule, that the greater the elevation the lighter the atmosphere, while the watery vapour it contains is diminished in quantity. Miasmatic influences lose their power if there are no very extensive marshes at high levels; infusorial germs are fewer and more scattered, and the earth rapidly absorbs the heat of the sun, but as quickly radiates it. The respiratory and circulatory functions are accelerated to compensate for the smaller quantity of oxygen inspired within a given time. Mountainous districts have characters of their own in the production of disease, and this generally in proportion to their elevation above the level of the sea. We know that certain animals and plants only inhabit lofty mountain ranges or elevated plateaux, and others low-lying valleys and plains, out of which they do not thrive. Amongst the domestic animals even we perceive striking differences, according to the altitude of the region in which they are bred and reared. This influence of elevation may act in several ways.

1. By diminution of the atmospherical pressure, tending to muscular and articular relaxation, the blood is apt to stagnate or transude through the walls of the vessels, especially in the mucous membrane of the air-passages, lungs, and brain. The heart also is quickened in its action.

2. Evaporation by the skin and the pulmonary surfaces is

* Parkes, 'Practical Hygiene,' chap. xvi.

augmented, and the function of the kidneys is diminished. This evaporation is increased by the dryness of the atmosphere, which is usually great at considerable elevations. The plateau of Mexico, however, which has high mountains, has its atmosphere rather humid.

3. The frequency of the circulation and respiration is counterbalanced, or rather caused, by the smaller quantity of oxygen the inspired air contains.

4. The temperature of the air is diminished as we ascend; and this, with the lessened calorific energy consequent on the altered respiration and the more active evaporation, causes the organism to suffer from cold.

5. The action of the sun's rays is greater than in low regions, and are supposed to be more penetrating, and to irritate the eyes, the brain, and the spinal cord.*

It has, therefore, been particularly remarked, that with men and animals living in high regions such phenomena as apoplexy, inflammation of the brain or its coverings, pulmonary hæmorrhage, inflammation of the respiratory organs, rheumatisms, asthmatic affections, and squamous diseases of the skin, are frequent. The fecundity of certain creatures would also appear to be hindered or altogether suppressed. On the Alps and other high mountains plants with a smooth external surface have this, assuming a more or less pilious character, and animals become more thickly robed in hair or wool; the latter would appear to be most notably affected by altitude. Many creatures which are not provided with a woolly coat on low-lying plains, such as cows, goats, and even horses and pigs, have this growth or something resembling it, at considerable heights, and sheep which will only grow hair at the sea-level, when removed to elevated regions become abundantly clothed with thick and fine wool.

Professor Willis, of Cambridge, attributed the broad sounds and the guttural consonants of mountaineers and the people of elevated plains to the physical action of the cold experienced at lofty altitudes.

Animals accustomed to live in these regions often suffer severely in descending to low plains. Toggia,† for example, informs us that cows and mares nearly always abort when they leave high mountains in the autumn to seek low pastures. This accident is probably due to the increased atmospheric pressure, and disturbance of the uterine circulation consequent thereon. Other examples of similar accidents will be given hereafter.

* Saussure, 'Voyages dans les Alpes,' vol. iv, p. 439. Hensinger, op. cit.

† Toggia, 'Malattie dei Boni,' vol. ii, p. 313.

The ascent of the Alps has often been observed to produce phenomena, which could only be ascribed to the diminished pressure of our aërial envelope. A very few examples must suffice.

Count Lusi, a Prussian officer of distinction, attempted, though unsuccessfully, the ascent of Mount Blanc, on the 15th September, 1816. Reaching the "Grand Mulêts," he was compelled to pass the night as his party best could. "We supped, I with very little appetite, having wine and water mixed with spices to quench our excessive thirst. Brandy occasioned such a nausea that I could not swallow it; and although accustomed to the constant use of my pipe, I experienced such sickness and disgust on attempting to smoke, that I was obliged to lay it aside." When he had attained the "Rochers Rouges," the condition of himself and companions is thus described:—"Our situation was distressing and excessively painful; our eyes were bloodshot and smarting with the heat; the skin of the face was almost baked, that of the lips scorched and cracked, and my feet were quite benumbed. Three of the guides bled freely from the nose, and one of them from the mouth. Antoine (a servant) and a guide complained of great nausea, and of an irresistible inclination to sleep."

Auldjo,* in his successful ascent, in August, 1827, on the summit of the "Grand Mulêts," notes—"I climbed to the top of the pinnacle, and attempted to smoke; but the rarity of the air rendered the scent of the tobacco so powerful and disagreeable that I was obliged to desist. . . . . In the middle of the night I awoke, but experienced none of the unpleasant nausea and sickness which have attacked others when sleeping on this rock, nor did the guides appear to suffer from any such feelings." In the continued ascent, next morning, it is added, "We endeavoured to get warm by 'the exertion of walking as fast as was consistent with the caution required in stepping on ice; but the attempt was vain, the cold was too piercing to be resisted, the snow collected on our shoes congealed, and severely affected the feet, while the whole frame was pervaded by a sense of pain, the effect of the intense cold, probably rendered the more acute by the rarefaction of the atmosphere." At the summit of the "Rochers Rouges" he further notes—"It was here that I felt the first symptoms of the effect produced on the body by the rarity of the air; for soon after I began to ascend I was seized with an oppression on the chest and a slight difficulty of breathing; a

* Auldjo, 'Narrative of an Ascent to the Summit of Mount Blanc,' London, 1830, pp. 36, 38, 38, 41, *et seq.*

quickness of pulsation soon followed, with a palpitation of the heart, a great inclination to thirst, and a fulness in the veins of the head; but still I experienced no headache, nor was there the slightest symptom of hæmorrhage or hæmoptysis. Most of the guides suffered in the same way, and to as great an extent as myself. . . . . Every few paces that we ascended the oppression and suffering became greater." Still higher these sensations became exaggerated. "The ascent from this point was very steep, and the difficulty of surmounting it was greatly increased; for those effects of the rarity of the atmosphere which we had felt previously now became exceedingly oppressive. I was attacked with a pain in the head; the thirst became intense; the difficulty of breathing much greater. The new symptoms I now experienced were, violent palpitation of the heart, a general lassitude of the frame, and a very distressing sensation of pain in the knees and muscles of the thigh, causing weakness of the legs, and rendering it scarcely possible to move them . . . . . We had to climb about an hour to get to the summit; but this part of the undertaking required a most extraordinary exertion, and severe labour it was. From the place where the rarity of the air was first felt we had been able to proceed fifteen or twenty steps without halting to take breath; but now, after every third or fourth, the stoutest, strongest guide became exhausted; and it was only by laying down or resting on the bâton some seconds, and turning the face to the north wind, which blew strong and cold, that sufficient strength could be regained to take the next two or three paces. This weakness painfully increased the difficulty of advancing up the ascent, which became every instant more steep . . . . . Some of the guides, also, were similarly affected, and even suffered more than myself. . . . . I was exhausted; the sensation of weakness in the legs had become excessive; I was nearly choking from the dryness of my throat and the difficulty of breathing; and my head was almost bursting with pain. My eyes were smarting with inflammation, the reflection from the snow nearly blinding me, at the same time burning and blistering my face." On reaching the top of Mount Blanc, greatly fatigued and embarrassed, this adventurous climber fell asleep. "In this state I remained a quarter of an hour, when I was roused to survey the mighty picture beneath. I found myself much relieved, but still had a slight shivering. The pain in the legs had ceased, as well as the headache, but the thirst remained. The pulse was very quick, and the difficulty of breathing great, but not so oppressive as it had been. . . . . Some bread and roasted chicken were produced, but

I could not swallow the slightest morsel; even the taste of the food created a nausea and disgust. One or two guides ate a very little; the rest could not attempt to do so." The writer also experienced the same lightness of body described by Captain Sherwill in 1827:—It appeared as if I could have passed the blade of a knife under the sole of my shoes, or between them and the ice on which I stood." The descent from the mount, though less difficult than the ascent, was yet not free from the pernicious influence of the attenuated atmosphere." From the position of the body, bending downwards, the effect of the rarity of the air on the lungs was not so great as it had been on ascending; but it oppressed the limbs with the distressing sensation of lassitude which I have adverted to. . . . . The crossing the plateau to our breakfast station was performed with distressing fatigue, from the softness of the snow, in which we sank up to the knees at every step. The oppression of heat from the sun burning intensely over us, and the rarefaction of the air causing me every moment to gasp for breath, produced such a degree of faintness, that I was obliged to throw myself repeatedly on the snow. Water was brought to me, and my temples rubbed with snow; and when a little recovered I proceeded a short distance forward, but again felt the necessity of resting; then the blood boiling in a state of fever, my face scorched by the reflection from the snow (for I could at this time wear neither mask nor veil), continued to render my state most painful and distressing. I got to the bridge, on which we had breakfasted, and where the atmosphere, although cooler than at any part of the plateau, still was at a temperature of fever heat. By lying on it with my face on the snow, I in a few minutes felt much relieved, and followed the advice and example of the guides by eating a morsel of chicken; but I could not satisfy the excessive thirst which parched my throat; our liquids were exhausted, and I attempted in vain to quench it with snow or water."

In 1775, an unsuccessful attempt was made to gain the summit of this mount by four villagers. They overcame many difficulties, but were obliged to return, on account of the suffering they endured from the suffocating heat and rarefied air.

Dr. Clarke, who ascended in 1825, gives similar evidence to Mr. Auldjo. With regard to the circulation and one pulse, when ascending to the "Grand Mulêts," it is remarked, "I was desirous of examining the rate of the pulse when we had been some time at rest, and found the pulse of one of our oldest porters to beat eighty-four; our captain,

eighty-four; my own, eighty-eight; the guide, ninety-two; Pierre Tairraz, one hundred and two; and Captain Sherwill, one hundred and eight. This result surprised me a good deal; I had expected to find the pulse on the strongest and most muscular subjects least accelerated. This, however, did not appear to be the case. Pierre Tairraz, a young Hercules in figure and muscle, had a pnlse fourteen beats quicker than my own; yet the observation was made with care, and I had no doubt of its accuracy." When near the summit, he writes, "Every two or three minutes we all sunk down in the snow, quite breathless, and scarcely able to utter a word. One of the guides had some hæmorrhage from an accidental blow, not from simple rarefaction of the air. The blood appeared to me decidedly of a darker colour than natural; our lips were quite blue; our faces extremely contracted and pale, and the eyes very much sunk, with a deep dark zone beneath the lower eyelids, but no one had the least spontaneous hæmorrhage from the gums or eyes. Every start we cast a longing look at the summit, and then holding our heads low, pressed onward, till the feeling of exhaustion became irresistible, and we sank again quite flat and still upon the snow. I had a slight tendency to nausea, most overwhelming headache, some pain of the breast, and rather feared the rupture of a blood-vessel, having been subject to hæmoptysis when a boy, but this pain and the rapid beating of the heart went off when we stopped to rest. When we were within a hundred yards of the summit I felt, in addition to other unpleasant sensations, a strong tendency to faint greater than I ever remember to have had except once from bleeding."

The derangement of the digestive organs is also mentioned by this authority. "It was laughable enough to see the same men, who a few hours before would have eaten a fraction of a roasted buffalo, now hanging their heads in silence, and fastidiously picking a pullet's wing. Worthy Simeon had still some appetite, but said that, after eating, his headache was increased. With some difficulty I got through half a chicken's wing, swallowed a few crumbs of bread and a few drops of wine, and this with raisins was my whole consumption of food during this fatiguing march of fourteen hours. The digestive powers seemed totally deranged: we were really in an incipient stage of fever, and required exactly the same treatment. The guides had brought up some lemonade from the rocks, but either our taste was vitiated or the liquor bad, for we could not drink it; nothing but a little snow and a few raisins seemed agreeable or refreshing."

A Chamounix guide told De Saussure that it was perfectly useless to carry provisions in making the ascent of Mount Blanc, for it was impossible to eat; and that if he ever tried it again, the only things he would carry would be a light parasol and a bottle of scent.

In Italy, thousands of sheep and goats spend the winter in low marshy districts where pasture is abundant, but their owners dare not trust them there in the summer, and remove the flocks to the mountains. In Corsica, too, in the commencement of summer, the shepherds emigrate with their flocks from the lowlands to the mountains and high plateaux, knowing well from experience that if they do not quickly leave the miasmatic regions they would soon lose nearly all their charge. Signor Eandi informs us that in the valley of Varaita, in Piedmont, the cattle driven from the lowlands to the Alpine regions suffer from many diseases to which they are no longer liable when they return again to the valleys.* And Tozzia reports that in Piedmont in general bovine animals become ill when they descend from the mountains to the valleys, being attacked with contagious pleuro-pneumonia, which soon becomes epizootic.†

In tropical countries, as will be noticed hereafter, changes from high to low situations, and *vice versâ*, are, as might be expected, very prejudicial to animals. Cutaneous affections are frequently very destructive amongst creatures taken from the elevated regions of South America to the burning plains.

It is curious to note that some enzootic and endemic, as well as several epizootic and epidemic maladies, are modified, or altogether absent in Europe and elsewhere at certain elevations. No fixed rule can be laid down with regard to the altitude to be attained before getting beyond the zone of a particular disease of this kind, as much depends on locality and the physical configuration of the district, and also on

* "Le bestie bovine condotte dai luoghi inferiori nei superiori delle valle di Varaita soffrono non poco e peggiorano pel cangiamento del pascolo assue facendosi defficilmente a pascolare nei boschi resinosi, quandochè in prima si nutrivano nei boschi dei castagneti; all opposto le bestie corigiate dall alto in basso fanuo buonissima prova e nulla soffrono."—*Statistica di Saluzzo*, vol. ii, p. 177.

† "Per si fatta predisposizione, che contraggono discendendo dal monte al piano, cambiando stalle poco difese, in paesi freddissimi, in altre piu stivate, e meno aërate in clima temperato, cambiando clima, pascolo bevanda, veggonsi cosi di spesso attacate dalla pneumonia contagiosa le rache della Savoja, della Svizzera delle valli di Suca e d'Aosta, o subito, o poco dopo giunte nelle pianure del Piemonte, od in quelle d'Italia, e da queste diffunderia epizootica pel Piemontc, per Novarese, e pel Milanese."—*Malattie dei Buoi*, vol. i, p. 66.

the character of the affection. In the Roman States it has been observed that houses situated only 150 feet above the malaria-engendering rice-fields are exempted from the maladies which prove so dangerous at lower levels. In some regions more than 500 feet above the sea level it has been asserted that many diseases more or less prevalent and fatal on the coast or low-lying plains are unknown. Cholera and Cattle Plague have been adduced as examples.

In 1865-6, in Yorkshire, no outbreak of Cattle Plague was recorded above 1000 feet, and it adhered most closely, if not entirely, to the lowlands and dales. In Norfolk, Cheshire, Staffordshire, and Buckinghamshire, it was observed to be more severe, and general in marshy and low-lying districts.*

I have heard that in Scotland this epizooty clung tenaciously to the banks and rivers, and Holland may be adduced as an example in this and the last century, of a country particularly scourged by it, though a foolish persistence in attempts to cure the pestilence have, no doubt, had much, if not everything, to do in perpetuating it. The Cotswold Hills in Gloucestershire, the ranges of the downs generally, and the uplands of Wilts have been particularised as escaping entirely, or with but little damage during the recent great invasion. In the last century, Wilts entirely escaped a visitation from 1745 to 1757, and it was remarked that no cases occurred at Highgate, near London. De Berg,† so long ago as 1776, asserted that, in general, the epizooty was much more fatal in low marshy countries, than in those of an elevated character. This author gives many reasons why it should be so. Veith,‡ however, asserts that it does break out in hilly regions, and that it is then all the more deadly; and Ampach§ asserts that he noticed the contagion was more active on the mountains than in the plains, and that the progress of the affection was more rapid. In the communication I made to the *Veterinarian* for November, 1865, I quoted some observations intended to show that the countries in which the malady has almost permanently established itself, and those which it occasionally invades, have all one common geographical feature; none of them reach, still less exceed, the altitude of 500 feet above the level of the sea.

When Switzerland was recently visited by the scourge, so far as I can ascertain, it never appeared at any moderate

* 'Third Report of Royal Commissioners on the Cattle Plague,' p. 8.
† 'Mémoire sur le Typhus.' 1776.
‡ 'Handbuch der Veterinarkunde.'
‡ 'Praktische Lehre von den Heerdekrankheiten, &c." Pesth, 1819.

elevation, and thanks to the well-directed efforts of the Government, which trusted entirely to its veterinary staff, as well, perhaps, as to its diversified surface, this bovine scourge did not remain many hours in that cattle-rearing country. It was the same with the cholera, which was imported last year into one of the cantons, for I think the first time in the history of Switzerland.

As in the human species, however, gôitre has been frequently seen in hilly countries all over the world, but especially has it been remarked as affecting the bovine species in the Pays-de-Dôme, France. Carbuncular or anthracoid maladies are also not unfrequent in mountainous, and probably in consequence of the varied and sudden changes of temperature in the Alps of Central Europe, together with altitude, and perhaps some other peculiar agencies, the contagious pleuro-pneumonia of cattle has been fostered as an enzooty from time immemorial, until, within the last century, through the influence of injudicious commerce, it began slowly to gain a footing beyond its birthplace, and rapidly within the last thirty years, it has been spread over nearly the whole of Europe, to Asia Minor, to South Africa, to North America, Australia, and New Zealand, by its contagious properties alone.

Variola ovina appears to be much influenced by altitude, so far as I have been able to ascertain, and to comport itself in this respect not unlike the cattle plague. It is the same with several other ovine disorders, which, troublesome, and often fatal in low localities, are seldom, if ever, apparent on mountain slopes or elevated plains.

Even in Lapland the effects of elevation are particularly discernible on that most useful animal, the reindeer. "No animal is more affected by heat than the reindeer," says De Capell Brooke; during the period, therefore, that the weather is hottest, when the thermometer of Fahrenheit, even at the North Cape itself, sometimes rises as high as 90°, they are always to be found on the summits of the mountains, seeking for the places where snow may yet remain, and should any breeze arise, they turn their faces towards it, and will in this manner wander several miles from the place where they may have been browsing." The hide even of this animal after death appears to be no less singularly affected by low altitude and the accompanying heat, for if it be kept in any warm or close place, shut out from the cold air, the fur falls off.

(*To be continued.*)

OBSERVATIONS ON STRYCHNIA.

By Professor Tuson, Royal Veterinary College.

The number of cases of poisoning of the lower animals by strychnia being apparently on the increase, it is hoped that the following remarks may not prove unacceptable to at least the younger practitioners of veterinary medicine.

Sources of strychnia.—Strychnia has been found in several species of plants belonging to the natural order Loganiaceæ. It is usually associated with another alkaloid called brucia, and exists in the plant in combination with an acid.

The chief source of strychnia is the seed of the *Strychnos nux vomica*. The seeds of this plant are commonly known as nux vomica or vomiting nuts, terms which have likewise been applied to other bodies, probably to St. Ignatius' Bean.

Preparation of strychnia.—Various processes have been devised for extracting strychnia from nux vomica; the following, however, is the one described in the last edition (1867) of the 'British Pharmacopœia':

"Take of

"Nux vomica	1 pound
"Acetate of lead . . .	180 grains
"Solution of ammonia . . .	a sufficiency
"Rectified spirit . . .	a sufficiency
"Distilled water . . .	a sufficiency

"Subject the nux vomica for two hours to steam in any convenient vessel; chop or slice it; dry it in a water-bath or hot-air chamber, and immediately grind it in a coffee mill. Digest the powder at a gentle heat for twelve hours with two pints of the spirit and one of the water, strain through linen, express strongly, and repeat the process twice. Distil off the spirit from the mixed fluid, evaporate the watery residue to about sixteen ounces and filter when cold. Add now the acetate of lead, previously dissolved in distilled water, so long as it occasions any precipitate; filter; wash the precipitate with ten ounces of cold water, adding the washings to the filtrate; evaporate the clear fluid to eight ounces, and when it has cooled add the ammonia in slight excess, stirring thoroughly. Let the mixture stand at the ordinary temperature for twelve hours; collect the precipitate on a filter, wash

it once with a few ounces of cold distilled water, dry it in a water-bath or hot-air chamber, and boil it with successive portions of rectified spirit, till the fluid scarcely tastes bitter. Distil off most of the spirit, evaporate the residue to the bulk of about half an ounce, and set it aside to cool. Cautiously pour off the yellowish mother liquor (which contains the brucia of the seeds) from the white crust of strychnia which adheres to the vessel. Throw the crust on a paper filter, wash it with a mixture of two parts of rectified spirit and one of water, till the washings cease to become red on the addition of nitric acid; finally, dissolve it by boiling it with an ounce of rectified spirit, and set it aside to crystallise. More crystals may be obtained by evaporating the mother liquor."

(*To be continued.*)

REMARKS ON FRACTURES.

By James Anderson, V.S., Glasgow.

The subject of fractures is of great interest to the veterinary practitioner, but to the surgeon it is of much greater interest, as he has to attempt a cure under all circumstances. With the veterinary surgeon it is different, as pounds, shillings, and pence, and also humanity has to be taken into consideration, which, in most cases, prevents treatment being adopted. Fracture is very common in domesticated animals, and more particularly in the horse, as he is most exposed. It is very requisite that the veterinary surgeon should be well up in diagnosing and prognosing cases of fracture so that his client may be guided by safe discretion as to how he should act, whether to kill or cure. In some cases it is very difficult to diagnose correctly.

In the month of February last, three horses met with accidents each at the same place, and from circumstances of the same kind. They occurred at a particular part of the Goods Department of the North British Railway Station, where it was necessary for them to cross rails. Somehow or other in the act of so doing, the toe of their off hind foot got firmly fixed about the rail, and on their making a forcible effort to withdraw it, fell on the off side. The results of the fall in the two first cases were the same, and both of them recovered, but in that of the third the lesion was much

greater, and the subject had to be destroyed. Of the two which recovered the following was the extent of the injuries sustained. By the peculiar manner of the fall, strain of the coronet was produced, from being the nearest yielding part to the fixed point. The inner and superior attachment of the hoof with the skin from the front part of the foot to the heel was detached, caused by the body falling outwards. Serum oozed from the capillaries of the sensitive part involved and trickled down the hoof. Treatment, a blister was applied all round the coronet, and I administered a purgative ball. In one of the cases the animal was off work for six weeks, in the other for a shorter period.

In the unsuccessful case, although the horse fell at the same place, and in a similar manner to the two preceding, still the results were much worse. The animal was very lame, and there were symptoms of fever. The hoof was detached at the same place as the others, but to a greater extent, and it bled a great deal.

Treatment.—I cut away the sharp superior border of the hoof, which was likely to irritate the wound. I then used Dr. Richardson's styptic in order to stop the bleeding, an agent which I have great faith in for stopping hæmorrhage. The part was bandaged with digestive ointment, and the coronet was blistered. Seeing that after a few days it was of no use trying further treatment I ordered the sufferer to be destroyed. On making a dissection I found that the navicular bone was fractured about a third from its inner angle, and the other part of it was partly torn from its socket.

On the 27th of April last a van-mare while at work suddenly became very lame in the near hind leg from slipping in the street. She was taken home with great difficulty, a distance of three miles from where the accident occurred. I was sent for and on my arrival she presented the following symptoms:—Leaning her off side against the side of the stall, with the lame leg elevated from the ground. The slightest bodily movement which she made caused dangling of the leg, indicating that some very important connecting tissue was destroyed. Fever; present pulse, 90. Breathing laborious. On manipulating the leg with the hands I caused crepitation to be heard distinctly at the hock, which was sufficient evidence of the presence of fracture. Sometimes by her occasional restlessness from great suffering, the toe of the foot would accidentally come slightly to the ground, which seemed to give rise to the most excruciating pain, as she always drew it quickly to her again. Although so slight concussion caused the pain to be so much intensified, yet,

strange to relate, if I placed the foot carefully to the ground in its proper position, she could then stand on it with comparative ease. I told the owner that my opinion was that fracture existed, and at the same time directed his attention to the crepitation. He, however, would not at that time be made convinced of it, from the fact of seeing her stand on it when I placed the foot to the ground. A few days after he was satisfied that such was the case, and he very properly got her put out of pain.

He sent me notice that he had done so, and I procured the hock, which I found in the following state:—The inter-osseous ligaments between the lower row of bones and metatarsus, were completely absorbed. A deposit of a very brittle and porous nature existed on the cuneiform medium and parvum, also on the head of large, and on the head of the inner small metatarsal, which deposits had been united and caused anchylosis. The anchylosis had acted as a substitute for the absent inter-osseous ligaments and others, so far as it had retained the bones in their place until the accident happened, when it was fractured, the fracture being at the base of the spavin, or that part of it where it was fixed to the metatarsus. On removing the cuneiform the greater portion of the spavin came along with it, and the spavin presented a rough surface corresponding to another which was on the large and inner small metatarsal bones marking their unnatural connections.

Observations.—I consider this a very peculiar and rare kind of fracture, and I am inclined to believe that the removal of the ligaments had been completed a considerable time prior to the date of accident. Sub-acute inflammation must have been going on all the while, and caused a change to take place in the structure of the bones involved, as, judging from their brittleness, they must have been very deficient of animal matter. I believe also that when the spavin was first deposited, it would contain a great deal more animal matter, and would be more of the nature of true bone, than at or before the time of accident, because the spavin had been present for a number of years. If it had always been of the same brittle nature, it never could have connected the bones so long as it did.

On the 23rd March a case of fracture occurred in the following simple manner:—While a groom was exercising two horses in his master's avenue, by riding one and leading the other, two crows suddenly arose from before them, which frightened the horses, and they became restless. In prancing, the animal which was carrying the groom trampled on the

near hind coronet of the horse which was being led. It was taken to the stable dead lame. My father was sent for, and he diagnosed it to be a case of fracture of the os coronæ. The owner, on hearing this, ordered the horse should be destroyed; and he waited until he saw the foot dissected, when my father's diagnosis proved to be correct. I have the specimen before me now, and it is separated into five pieces.

I have another specimen of fracture before me of fracture of the os coronæ. The subject had been previously used for the saddle; and after a year's rest it was put to harness work. When it was being driven one day, at a sharp trot, the os coronæ suddenly broke from concussion. My father tells me that fracture of the os coronæ was very common at a time when horses were employed for passenger boats at the Glasgow and Paisley Canal, from concussion caused by their being made to gallop along the canal bank. It was generally done while going under a bridge. On one occasion the accident occurred to two horses at the same time.

Facts and Observations.

The Artificial Production of Tuberculous Disease.—The subject of the production of disseminated tubercle artificially by inoculation was brought before the Pathological Society on Tuesday night by Dr. Sanderson, in a very important communication. In co-operation with Mr. Simon, Dr. Sanderson has been watching, in guinea-pigs, the effects not only of the introduction into the subcutaneous tissue of tuberculous and pyæmic matter, but of mechanical irritation. In the first place Dr. Sanderson confirms the results of previous observers as to the identity of the morbid process produced by inoculation experiments with that which we recognise in phthisis. But the remarkable point shown by the present series of experiments is this, that when products other than tubercular are used for injection the result is the same, in the case of mere local irritation likewise —with a seton, for example—provided the action of the agency be not so severe as to cause early death, and sufficient to induce decided change in the local nutrition of the part operated on. Having explained this much, Dr. Sanderson handed round specimens of liver, cellular tissue, glands, lung,

and other organs, showing the various changes artificially produced. In regard to the cellular tissue, there are found induration, abscess in the centre of the latter, and small secondary abscesses in large numbers around. The microscope shows the induration to consist of nuclei or corpuscles entirely spherical, and the central part to be pus, a large number of "farcy cords" being present also. The glands in connection with the inoculated spot are always affected; they are hyperplasmic, and the contents undergo caseous degeneration. In the lungs, grey granulations having the features of miliary tubercles are found, and the microscope detects a central portion consisting of round nuclei in a stroma, and an outside portion consisting of the thickening of the parieties of the aveoli, caused by the production of nuclear bodies, and epithelial accumulations and pigment granules in the cavities; the principal seat of change being therefore in the walls of the aveoli, as indicated by the presence of nuclear corpuscles in a site where none exist normally. The liver is found to be enlarged, and to be invaded by new deposits (the same as that before described as seen in the lungs) around the branches of the bile-duct and the veins—an interlobular growths throughout the liver. Lebert calls it interlobular inflammation. Dr. Sanderson names the deposit adenoid tissue, because it bears resemblance to the pulp of lymphatic glands. In the peritoneum the same kind of foreign material is observed, apparently unconnected directly with the arteries. As we have said before, these pathological results are the same whatever be the matter used, and if only local irritation be employed to cause glandular irritation. The conclusions to which Dr. Sanderson's experiments lead are clearly these, if the produced deposit be allowed to be true tubercle: that there is no specific virus or materies morbi in phthisis; and that in the process of miliary deposit, the first step may be somewhat allied to, if not identical with, caseation of the inflammatory product in lymphatic glands, as stated by some of the continental authorities. Dr. Bastian, in the discussion, took exception to the identity of the deposit in Dr. Sanderson's preparations and true tubercle. Mr. Simon, however, in the remarks he made upon the matter, specially referred to this point and the difficulty of defining the meaning of tubercle. It cannot be but intensely interesting, as he said, that the disease corresponding with what our present knowledge depicts as tubercle should be produced extensively throughout bodies of rodent animals by common irritation. It seems that Sir James Kay Shuttleworth, many years ago, in experimenting with the subcutaneous injection of mercury,

was struck with the production of a condition like tubercle in different parts of the body. The subject is extremely interesting, and Dr. Sanderson has earned for himself such a reputation for accurate and patient research as entitles him to belief beyond the average. We must necessarily recur to so important a subject.—*Lancet.*

Piece of Wire fixed to the Pericardium.—We have received from Mr. Phillips, M.R.C.V.S., Market Drayton, an interesting specimen of diseased heart and pericardium of a cow, in which the disease was produced by a piece of wire, which, having penetrated the pericardium, subsequently became fixed to its inner surface. The animal had been under the care of a cow-leech, and was only seen the day before its death by Mr. Phillips. No satisfactory history of the case could be obtained.

Cutting Steaks from Living Animals.—The *Herald* correspondent gives some interesting facts concerning the character of the Abyssinians. Among other things he confirms the truth of what Bruce had said, viz., that the natives cut steaks from the living ox. Some officers lately came upon the natives just as they were performing this cruel act. The unfortunate bullock was thrown down, and its four legs were tied together. The operator then cut an incision in the skin near the spine, just behind the hip joint. He blew into this to separate the skin from the flesh, and then cut two other incisions at right angles to the first, and then lifted a flap of skin four or five inches square. From this he cut out a lump of flesh, cutting with the knife under the skin, so that the amount of flesh taken out was larger than the portion uncovered. The operator then filled up the hole with cow-dung, replaced the flap of skin, plastered it up with mud, untied the feet of the poor animal, who had kept up a loud moaning while the operation was going on, gave it a kick to make it get up, and the whole thing was over. I should mention, adds the writer, that the operator cut two or three gashes in the neighbourhood of the wound, apparently as a sign that the animal had been operated upon in that part. The officer observed that several of the other cattle in the same herd were marked in a precisely similar manner. They returned in half an hour and found the animal walking about and feeding quietly.

Disease in Sheep induced by Rough Weather and Immersion in Salt Water during a passage of three or four days in a steam vessel.—Mr. C. A.

Calvert, V.S., Wangomin, has furnished us with the following account of the symptoms and treatment of a disease in sheep, induced by the above-named causes.

Symptoms.—The animals refuse all kinds of food, but drink eagerly. The body is hot, and a violent fever sets in in the earliest stage. The breathing is very much oppressed and accompanied with a moaning sound. All action of the bowels and urinary organs appears to cease.

Some of the animals have so far recovered as to commence eating, and to stand, and even walk about; but after the lapse of a few days large swellings appear in the hocks and knee-joints. These suppurate, and notwithstanding every care, after a day or two they assume an unhealthy condition, and the poor animals again relapse into their former state, and have in every case died.

Treatment.—The remedies I have employed have been simply gruel combined with stimulants, and bleeding from the eye and toe. I have also given a little laxative medicine.

The animals that have died from the above cause have been principally rams of the Lincoln breed.

Official Acknowledgment of the Services of the Newcastle Inspectors.—The Easter Quarter Sessions for the County of Northumberland were opened on April 8th, in the County Justices' Hall, Morpeth—C. W. Orde, Esq., of Nunnykirk, in the chair. There were also present the Rev. Edward Lawson, of Longhirst Hall; the Rev. E. C. Ogle, of Kirkley; Sir Arthur Monck, Bart., of Belsay Castle; Capt. C. H. Cadogan, Brenckburn Priory; Watson Askew, Esq., Pallinsburn; R. B. Sanderson, Esq., Jesmond, Newcastle; John Craster, Esq.; Thomas Coppin, Esq., Tynemouth; Thomas Anderson, Esq., Little Harle Tower; and W. Cookson, Esq. Meldon Park.

County and Police-rate Arrears.—Mr. Anderson read the report of the Finance Committee, which recommended that a rate of 3*s.* 4*d.* in the pound be imposed at the present sessions, to be paid on or before the 23rd of May next. The report further stated that there was at present a balance of £2392 18*s.* 9*d.* in the treasurer's hand, which could be applied to the payment of orders now required to be made.

The report was adopted, and it was ordered that proceedings should be taken against such townships as were in arrears.

Mr. R. B. Sanderson said it would eventually come to their having to levy an additional rate over the entire county.

Cattle Plague and the Newcastle Inspectors.—Mr. Anderson said there was another item of finance which he wished to call the attention of the justices to. About three years ago a committee was appointed by the quarter sessions to take proceedings to put all cases of cattle plague under certain regulations and restrictions. The two veterinary surgeons appointed as cattle plague inspectors for Newcastle—Mr. Wilkinson, who was inspector for the port of Tyne, and Mr. Stephenson, who was inspector for the borough of Newcastle—had both, at the invitation of the justices, attended before the committee, and had given very valuable information, which, if it had been acted on at once, he doubted if there would have been more than one case of cattle plague throughout the entire county, and that would have been the one at Morpeth. However, their recommendations and information were very tardily made use of, and the county suffered in consequence. These gentlemen had not yet received any remuneration for their attendance, and as there was still a portion of the cattle fund existing, he would beg to move that each gentleman be presented with a gratuity of five guineas out of the fund, and that the thanks of the county be also given to each.

The chairman asked the clerk whether they had any power to dispose of the cattle plague fund in that manner.

The Clerk of the Peace replied that it was a legitimate use to put the money to.

Mr. Askew seconded the motion of Mr. Anderson, which was unanimously carried.

The New Anæsthetic (?)—A very opportune discussion took place at the Medical Society of London, on Monday night last, on the so-called anæsthetic nitrous oxide gas. A question on the subject addressed to the President, Dr. Richardson, whose authority on such a point cannot be questioned,—drew from him a clear and careful summary of its action. It was painful, he remarked, to see the childish excitement with which nitrous oxide, and its effects had recently been dwelt on. The gas had been treated as an unknown, wonderful, and perfectly harmless agent; whereas in simple fact, it was one of the best known, least wonderful, and most dangerous of all the substances that had been applied for the production of general anæsthesia. No substance had been physiologically studied with greater scientific zeal or more rigid accuracy; and no substance had been more deservedly given up as unfit and unsafe for use. It had caused death in the human subject, and on animals it

was so fatal that, with the utmost delicacy in its use, it was a critical task thoroughly to narcotise an animal with the gas without actually destroying life. In some cases, also, animals died after recovering from the insensibility.

Respecting the mode of action of the nitrous oxide, Dr. Richardson explained that it was not, in the true sense, the agent that caused the insensibility. It acted indirectly, and the immediate stupefier was really carbonic acid. In fact, nitrous oxide is an asphyxiating agent. There are two explanations of this. It may be that the nitrous oxide quickens the oxidation of blood, and so causes accumulation of carbonic acid in the blood; or it may be—and this is most probable—that it acts by checking the outward diffusion of carbonic acid. The vapour density of nitrous oxide and of carbonic acid is the same, namely, 22, taking hydrogen as unity; and as diffusion of gases into the blood and out of it is governed by the same laws as in ordinary diffusion, to make an animal breathe nitrous oxide is virtually equivalent to making it breathe carbonic acid itself, the diffusion of carbonic being so determinately impeded. The living phenomena were also in character: the arterial blood was rendered venous by nitrous oxide; the animal temperature fell; the skin became livid. And although these symptoms might be induced many times without actually destroying life, they could not be sustained for any length of time without certain disaster. Dr. Sansom followed in nearly the same strain.

In speaking out thus boldly to a professional audience, Dr Richardson has not spoken a moment too soon. The *ad captandum* method of applying the most potent medicinal agents against the teachings of scientific experiment and the experience of accepted observers, is a phase in physic which requires to be put down with a strong hand. Administration of nitrous oxide, or laughing gas, as it is commonly called, is becoming a pastime for amateurs. We hope these few and timely words will prevent a catastrophe. If they fail, the fault or neglect will not rest with us.—*Lancet.*

We have much pleasure in announcing that Professor Bouley, of the Alfort Veterinary School, has been elected a member of the French Institute, the chief scientific body of France.

THE VETERINARIAN, MAY 1, 1868.

Ne quid falsi dicere audeat, ne quid veri non audeat.—CICERO.

"NOBODY outside the agricultural interest," Professor Huxley said in his inaugural address to the members of the Working Men's College, "now dares to say that education is a bad thing." We doubt if anybody inside or outside the agricultural or other interest ever said in the sense of deliberately intending it, that education in its entirety is a bad thing, but many thinking men in all kinds of interests doubt whether, if education is to stop short at reading and writing, it would not be better to remain in total ignorance. Other persons, however, hold the belief that it is possible to educate a man beyond his station, to teach him discontent by first making a gentleman of him, and then condemning him to follow the plough. If it is a true doctrine, and we do not dispute it, that the "masses should be educated because they are men and women with unlimited capacities of being, doing, and suffering," then there is work for hand and brain, to develop a system or number of systems which shall give every man the power and the desire to make the best of the position in which he is placed, and in which, speaking of the masses, he will assuredly remain for life as firmly fixed as though he were fettered to a rock. What kind of education is necessary for the mechanic or the agricultural labourer, how far it may be safe and advantageous for him to pursue the path of study? are questions which we are, happily for ourselves, not called upon to decide. Our task is a special one, and we address ourselves to it in good faith, leaving to others the more arduous and not less honorable than arduous duty of solving problems, the intricacy of which has exercised and will continue to exercise the ingenuity of active and benevolent minds.

There is no question of degree in the system of education which we are pledged to support, writing as we now are in the interest of a liberal profession. No shadow of doubt

is cast upon the clear and well-defined path which it is our privilege to indicate. The study of science has no limits; knowledge which is pursued for its own sake is always its own reward. The professional man need never ask himself how far he may educate his son without making him discontented with the position he is destined to fill. If he looks back at all on his past life with regret, it will be because he has not learned enough, never that he has acquired too much. In the colleges, the period of study is necessarily brief; the main anxiety is and in the nature of things must be to pass the final test, and secure the certificate of qualification, and this object having been gained, there is commonly too much of the so-called practical element, the struggle for daily bread or the accumulation of wealth, as the case may be, to permit the cultivation of a taste for the acquirement of knowledge beyond what is absolutely necessary for the immediate object in view. Much of the listlessness and even distaste for study that is observed among students is due to an unprepared condition of mind which unfits for the reception of technical instruction, however conscientious and painstaking may be the efforts of those who are engaged in the task of teaching. Practically we have some knowledge of the systems of instruction which are carried out at veterinary and agricultural schools. Taking the agricultural college at Cirencester as the principal illustration of one department, and the veterinary college in London of the other, we have experimentally realised the insurmountable difficulties under which the teachers labour in their attempts to impart a knowledge of science to those from whose previous education everything relating to science has been sedulously excluded. In our own experience the professors of both institutions have often deplored the want of a previous training for the students both of agriculture and veterinary science. To supply the defect in the present educational system, Professor Tuson proposes to establish a training college, and whatever measure of success may attend the scheme the intention is meritorious. That the idea has been well considered and deliberately matured we do not doubt, and the names of men eminent in medical

agriculture and physic in the appended list of patrons proves that the plan suggested is not chimerical, and it is by no means an insignificant circumstance that among the names are those of the principal of the Royal Veterinary College, and the chairman of the Royal Agricultural College at Cirencester.

The originator of the "Training College" has issued a prospectus giving the names of the patrons, and detailing the intended plan of instruction. In reference to the object of the institution and the arrangement of subjects, we quote the following statements :

This College will be founded for the purpose of supplying an admitted want, namely, an institution in which youths intended for the professions of Veterinary Medicine and Agriculture can be furnished with that preliminary general and scientific education which is so highly essential—

1stly. To enable them to quickly comprehend the technical terms employed in the various branches of Medical and Agricultural Science, to follow the reasonings of lecturers and authors, and therefore to readily and thoroughly master the subjects which engage their attention while pursuing the advanced and professional courses of study taught in Veterinary and Agricultural Colleges.

2ndly. To enable them to grasp principles, to appreciate their value, and to acquire the power of applying them with facility in the practice of their professions.

3rdly. To enable them to raise the dignity and increase the importance of their callings, also to fit them for occupying that social position which is allotted to every educated man.

CURRICULUM OF STUDY.

English.—Grammar, Composition, Writing from Dictation, and Reading aloud.

Arithmetic.—Attention will be principally given to the First Four Rules, the Rule of Three, Vulgar Fractions, and Decimal Fractions.

Latin. French. Geometry. Algebra. } These subjects will only be taught to those pupils who have attained proficiency in English and Arithmetic. The extent to which they will be pursued will depend upon the aptitude and industry of the pupil.

Zoology.—Rudimentary information respecting the characters, habits, and physiology of domesticated animals.

BOTANY.—Structural and Physiological Botany of Plants employed as food and medicine for domesticated animals; also of poisonous plants growing on British pastures. In order that a practical acquaintance with this department of knowledge may be obtained, the Lectures will be illustrated by fresh and dried specimens, and frequent field excursions will be made by the Class, under the personal direction of the Teacher.

PHYSICS.—The Laws and leading Characteristics of Heat, Light, Electricity, &c.

CHEMISTRY.—The fundamental Facts and Principles.

PRACTICAL CHEMISTRY.—A Laboratory will be provided, in which instruction will be given in the rudiments of Analytical and other branches of Experimental Chemistry.

PERIOD OF STUDY.

The curriculum is so arranged that youths of average ability and industry may pass through it in one Session. The Session will be divided into three Terms:

The 1st Term will commence on the 1st of September and end at Christmas.

The 2nd „ „ „ in the third week in January and end at Easter.

The 3rd „ „ „ a fortnight after Easter and end in the middle of July.

Pupils, who must be at least fourteen years of age, are admitted at the commencement of either Term, and are expected to remain at the College one entire Session.

PRIZES.

Prizes consisting of Medals, Instruments, Books, &c., will be annually awarded in each class, and a "General Proficiency Prize" will be given to the Pupil who shall pass the best examination in all subjects taught in the College.

Every Pupil who diligently attends to his studies during one entire Session, and who passes the terminal examinations, will be entitled to a "Certificate of Proficiency."

The College will be opened on the 1st of September, 1868.

It is requested that the names of Gentlemen desirous of becoming Pupils may be sent, on or before the 15th of June next, to—

PROFESSOR TUSON,
Royal Veterinary College,
Camden Town,
London, N.W.,

From whom printed Forms of Application for the admission of Pupils may be obtained.

The names of the following gentlemen connected with professions of medicine, chemistry, agriculture, and veterinary medicine appear in the list of patrons:

Professor Anderson, M.D., F.R.S.E., *University of Glasgow.*
J. Druce, Esq., *Member of the Council of the Royal Agricultural Society.*
W. Ernes, Esq., *Ex-President R.C.V.S.*
W. Field, Esq., *Ex-President R.C.V.S.*
W. Field, Jun., Esq., *President R.C.V.S.*
Professor Frankland, F.R.S., *Royal School of Mines.*
Brandreth Gibbs, Esq., *Member of the Council of the Royal Agricultural Society.*
Dr. Gilbert, F.R.S.
W. J. Goodwin, Esq., *Ex-President R.C.V.S.*
Edward Holland, Esq., M.P.
T. Hughes, Esq., M.P.
R. L. Hunt, Esq., *Ex-President R.C.V.S.*
J. B. Lawes, Esq., F.R.S.
J. Lawson, Esq., F.R.S., *Ex-President R.C.V.S.*
H. Lepper, Esq., *Examiner R.C.V.S.*
W. Mavor, Esq., *Examiner R.C.V.S.*
Professor Miller, M.D., *Treasurer, Royal Society; Examiner R.C.V.S.; King's College, London.*
R. Pritchard, Esq., *Examiner R.C.V.S.*
Clare Sewell Read, Esq., M.P.
Dr. B. W. Richardson, F.R.S.
Wm. Robinson, Esq., *Examiner and Ex-President R.C.V.S.*
Professor Rolleston, M.D., F.R.S., *University of Oxford.*
Professor Sharpey, M.D., LL.D., *Secretary, Royal Society; Examiner R.C.V.S.; University College, London.*
F. Silvester, Esq., *Ex-President R.C.V.S.*
Professor Simonds, *Ex-President R.C.V.S.*
Professor Spooner, *Ex-President R.C.V.S., Principal of the Royal Veterinary College.*
Professor Taylor, M.D., F.R.S., *Examiner R.C.V.S.; Guy's Hospital.*
Professor Turner, M.B., F.R.S.E., *University of Edinburgh.*
Professor Varnell, *Ex-President R.C.V.S.*
Dr. Voelcker, *Royal Agricultural Society of England.*
J. Wilkinson, Esq., *Ex-President R.C.V.S., Principal Veterinary Surgeon to the Army.*

Difficulties will be encountered in carrying out the detail of the proposed preparatory college, but we do not recognise any insurmountable obstacle, unless it be the apathy of the veterinary profession. It takes a great deal generally to

galvanize us as a body into activity, but recently we have shown signs of the vitality that has been lying dormant so long. Our future lies within us, and we may quite assure ourselves of the fact that the legislature and the public will accord to us, not what we may ask with faltering and doubtful voice, but what we can prove we deserve. It is a subject of complaint at present that so many "*practical men,*" without certificated qualification, usurp the patronage which should be awarded to the members of the profession. Our protest would come with more force if we could point to every individual who possesses a diploma as a man of liberal education and competent scientific knowledge. Success after all is the only recognisable test of merit, and the public will not be slow to discover who deserves to be supported. Just now the education of the farm labourer is the question of the day, and the Government proposes even to insist upon his tuition being systematically carried out. If the veterinary profession does not make some efforts in the same direction, it may be—we hope to be pardoned the suggestion—that the "cow-man" of the next generation will sit in judgment upon the dog Latin of the doctor's prescription.

Extracts from British and Foreign Journals.

THE ATMOSPHERIC GERM THEORY.

(*A Lecture delivered to the Royal College of Surgeons, January* 17, 1868.)

By John Hughes Bennett, M.D., F.R.S.E., Professor of the Institutes of Medicine and Senior Professor of Clinical Medicine in the University of Edinburgh, &c. &c.

(*Continued from* p. 248.)

It would occupy too much time to follow the development of all the forms that may arise. They originate always long after the primary vibrios are produced, in the secondary, tertiary, or even later molecular masses, resulting from the disintegration of previous forms.

It frequently happens that soon after some of these higher infusoria are seen, that the pellicle falls to the bottom of the

fluid, where it constitutes a dense precipitate, and slowly breaks down; then another scum forms on the surface, and molecules, bacteria, and vibrios are again produced.

These different forms are spoken of by Ehrenberg and other naturalists as being different species;* but I think it will be found that the laws, not only of molecular but of alternate generation and parthenogenesis, prevail among them, and one frequently passes into another. Their production is largely dependent on temperature, state of the atmosphere, light,—especially the sun's rays, and other physical conditions.

At other times, it happens that the molecular mass, instead of being transformed into animalcules, gives origin to minute fungi. In this case the molecules form small masses, which soon melt together to constitute a globular body, from which a process juts out on one side. These are *Torulæ*, which give off processes which are soon tranformed into jointed tubes of various diameters, terminating in rows of sporules (*Penicillium*), or capsules containing numerous globular seeds (*Aspergillus*). Occasionally filaments are formed from the direct melting together of molecules arranged longways. (See fig. 1, *f*.)

Here also I think various so-called plants pass into one another, especially torulæ, which are only embryonic forms of higher fungi. In all these cases no kind of animalculæ or fungus is ever seen to originate from pre-existing cells or larger bodies, but always from molecules.

That we should sometimes have animalcules, and at others fungi, is a well-known fact, the exact causes or conditions producing which are not yet explained. The Panspermatists, of course, are of opinion that the germs in the atmosphere are of different kinds, and that as they fall into different infusions they produce different results, in the same manner that varieties in ova or seeds develop themselves in peculiar localities or special soils. This assumption, however, seems to me opposed by the following experiment:—

If an infusion be placed in a deep glass vessel, which again stands in the centre of a shallow vessel containing the same infusion, and the whole covered with a large bell glass, it will be found in eight days that on the surface of the former are numerous ciliated animalcules, while on that of the latter only bacteria and vibrios exist. The experiment may be reversed, for if the shallow vessel be filled to the brim, and the deep vessel has only its bottom covered, then the ciliated

* See Ehrenberg's 'Infusoria.'

microzoa will appear in the former, and the non-ciliated in the latter.*

As a result of these experiments, Pouchet has formularised a law to the effect that the production of ciliated animalcules is in an inverse ratio to the square of the surface, and that the production of monads is in a direct ratio to the cube of the mass of the same fluid.† To this law I have met with some exceptions, animalcules having been produced in some of our recent experiments in the shallow dish, and vegetations in the deep vessel, and *vice versa*.

It is difficult to explain how germs falling from the air on the same infusion, under identically similar conditions, with the exception that the fluid is in vessels of different forms, can vary the results. Whereas the fact that the higher infusoria are formed secondarily out of the disintegrated mass of the simpler ones, which can only take place where that mass is considerable and floating on the surface of deep fluids, directly confirms the molecular theory of growth, and offers an illustration of how successive disintegrations give origin to different formations.‡

That the infusoria originate and are developed in the molecular pellicle which floats on the surface of putrefying or fermenting liquids, has been admitted by all who have carefully watched that pellicle with the microscope, more especially by Kutzing,§ Pineau,‖ Nicolet,¶ Pouchet,** Jolly and Musset,†† Schaafhausen,‡‡ and Mantegazza.§§ The question therefore is, are the molecules that constitute that pellicle derived from the air or the fluid,—are they precipitated from above, or do they float to the surface from below, like the globules of the milk which produce cream?

Now, it was in consequence of having professed to demonstrate what had escaped all previous observers,—viz., the germs in the air,—that M. Pasteur has made his name so

* Pouchet's 'Nouvelles Expériences,' etc., pp. 135, 243—245. Paris, 1864.

† 'Nouvelles Expériences,' p. 134.

‡ See "On the Molecular Theory of Organisation," by the Author. 'Proccedings of Royal Society of Edinburgh,' 1861.

§ See Schaaffhausen, 'Comptes Rendus,' tome liv., p. 1046.

‖ 'Annales des Sciences Naturelles,' 3me sérié, tome iii, p. 182. This observes thinks he saw disintegrated fibres of meat and of other substances formed directly into vibriones,—in this he was incorrect.

¶ 'Arcana Naturæ,' tome i, p. 2.

** 'Hétérogénie,' p. 353. 'Nouvelles Expériences,' p. 111.

†† 'Comptes Rendus,' tome l, p. 934.

‡‡ Ibid, tome liv, p. 1046.

§§ 'Institut Lombard,' 1852, tome iii.

famous. He tells us* that he did this by causing a current of air to pass through a glass tube in which a pledget of gun-cotton had been placed. This was then dissolved in ether, and the sediment allowed to collect in a watch-glass. This sediment, after being repeatedly washed, and allowed to remain in distilled water for twenty-four hours, is allowed to dry. A portion of the dried matter is then put upon a slide moistened with a weak solution of potash, and, being covered with another glass, is examined with the microscope. The results he has figured; and, very properly, he has given the scale of magnifying power under which they were drawn (fig. 8), and which, by careful measurement, I have ascertained to be 180 times linear. I show you his drawings, carefully copied.

Fig. 6. Fig. 7. Fig. 8. Fig. 9. Fig. 10.

Exact copies of the figures given by M. Pasteur of the dust he collected on gun-cotton, magnified 180 diameters. These should be compared with Fig. 1, magnified 800 diameters, showing what is seen to take place when infusoria are forming. Fig. 10, scale of one hundredth of a millimètre.

He says figs. 6 and 7 represent organised corpuscles from dust collected in twenty-four hours, from the 16th to 17th November, 1859. The manner in which these drawings, giving the volume and outline of the bodies, were made, is as follows :—"After the dust has been prepared in the manner described, I took a portion of it from the watch-glass, and diluted it with a solution of potash, consisting of 5 parts of potash in 100 of water. As soon as I perceived a globule evidently organised under the microscope, I drew it. This is how figure 4 was drawn."† This description leaves it uncertain whether an exact copy was taken of any portion of the field of the microscope, and, therefore, whether the figure represents the exact number of corpuscles present, and their relation to each other. It only gives their form. But, assuming that the same kind of demonstration was made in each case, we have the relative numbers of these bodies taken from the gun-cotton in fig. 6. Fig. 7 is another demonstration of the same after the addition of an aqueous

* 'Annales des Sciences Naturelles,' 4me série, tome xvi, p. 25.
† *Ibid.*

solution of iodine. Fig. 8 represents the organised corpuscles associated with amorphous particles obtained on the 25th and 26th of June, 1860; fig. 9, the dust of an intense fog in the month of February, 1861. In all these demonstrations he admits the organised corpuscles are comparatively scarce, because, he observes (p. 31), it is frequently necessary to change the field in order to see one of them, whilst at other times several could be seen together.

(*To be continued.*)

A SEARCH FOR SOLID BODIES IN THE ATMOSPHERE.

By R. Angus Smith, Ph.D., F.R.S., &c.

I have so frequently for many years attempted to find, and have found, organic substances which have passed from the air into liquids in which they were collected, that perhaps the Society will scarcely attend to another attempt, although it indicates, I think, some progress. It was in the year 1847 that I first collected what I believe was matter from the respiration and perspiration, and found that as it was kept it grew into distinct confirmed forms.

Whilst examining some matters relating to the cattle plague I found one or two remarkable points. I had before that time used aspirators to pass the air through liquids, except in the oxidation experiments. At that time I used simply a bottle which contained a little water. The bottle was filled with the air of the place, and the water shaken in it. The difference of the air was remarkable. A very few repetitions would cause the liquid to be muddy, and the particles found in many places were distinctly organic.

It may, however, interest the Society to hear of a few of these previous attempts, the latest made till recently. I shall therefore read from a report to be found in the appendix to that on the cattle plague.

"Mr. Crookes also brought me some cotton through which air from an infected place had passed. It was examined at the same time. Taking cotton in the mass nothing decided was seen; but when it was washed some of the separate films were coated over with small nearly round bodies, presenting no structure, or at least only feeble traces of it, and perhaps to be called cells. I had not sent gun-cotton, as I intended, to Mr. Crookes, fearing the rules of the post; otherwise there would have been more certainty that the bodies spoken of did not exist previously on the cotton. However, Mr. Dancer,

who has examined cotton with the microscope oftener than most persons, even of those experienced in the subject, had never observed a similar appearance.

"The liquid had also a number of similar bodies floating in it.

"It was then that Mr. Crookes sent a liquid which he had condensed from the air of an infected cowshed at a space a little above the head of a diseased cow. It was also examined, and it presented similar indications of very numerous small bodies. Not being a professed microscopist, I shall not attempt a description, but add that they clearly belonged to the organic world, and were not in all cases mere débris. We found also one body a good deal larger than the rest; it resembled somewhat a paramecium, although clearly not one.

"We found no motion whatever, and only this latter substance could be adduced as an absolute proof of anything organized being present. Next day I examined the same liquid; and, whether from the fact of time being given for development or from other causes, there was a very abundant motion. There were at least six specimens in the field at a time, of a body resembling the euglena, although smaller than I have seen it. When these minute bodies occur it is clear that more may exist, and germs in this early stage are too indefinite to be described. The existence of vital sparks in the organic substances in the air alluded to is all I wish to assert, confirming by a different method the observations of others. It might, of course, be said that since the bottle was opened at Mr. Dancer's, the air at that place may have communicated them. I answer that, before it was opened, a good glass could detect floating matter, some of it, however, as in the microscope proved, indefinite enough.

"Finding this, and fearing that the long time needful to collect liquid from the atmosphere might expose it also to much dust, I used a bottle of about 100 cubic inches dimensions, and putting with it a very little water, not above five cubic centimètres, I pumped out the air of the bottle, allowing the air of the place to enter. This was done six times for each sample, the water shaken each time, and the result examined. This was done with the same bottle that was used in my early experiments with permanganate, and by the same method, except that water instead of that salt was used. At first considerable numbers of moving particles were found; but it was needful to examine the water used, and here occurred a difficulty. It was not until we had carefully treated with chemicals and then distilled the water again and again that we could trust it. Particles seemed to rise with

the vapour, and if so, why not with the evaporating water of impure places.

"Having kept an assistant at the work for a week, and having myself examined the air of three cow-houses, I came to the conclusion that the air of-cow-houses and stables is to be recognised as containing more particles than the air of the street in which my laboratory is, and of the room in which I sit, and that it contains minute bodies, which sometimes move, if not at first, yet after a time, even if the bottle has not been opened in the interval. There is found, in reality, a considerable mass of débris with hairs or fine fibres, which even the eye, or at least a good pocket lens, can detect. After making about two dozen trials, we have not been able to obtain it otherwise. Even in the quiet office at the laboratory there seemed some indications.

"I found similar indications in a cow-house with healthy cows; so I do not pretend to have distinguished the poison of cattle plague in these forms; but it is clear that where these exist there may be room for any ferment or fomites of disease; and I do not doubt that one class is the poison itself in its earliest stage. It would be interesting to develop it farther.

"I have recorded elsewhere that I condensed the liquid from the air of a flower garden, and found in it, or imagined I found, the smell of flowers. I do not remember that I looked much to the solid or floating particles, thinking them to be blown from the ground, but it does not affect the result, whether they be found constantly in the air or are raised by the action of currents."

Lately I tried the same plan on a larger scale. A bottle of the capacity of 4990 c.c. was filled with air and shaken with water. The bottle was again filled and shaken with the same water, and this was repeated 500 times, nearly equal to $2\frac{1}{4}$ million c.c., or 2495 litres. As this could not be done in a short time, there was considerable variety of weather, but chiefly dry, with a westerly wind. The operation was conducted behind my laboratory, in the neighbourhood of places not very clear, it is true, but from which the wind was blowing to all parts of the town. I did not observe any dust blowing, but if there were dust it was such as we may be called on to breathe. The liquid was clouded, and the unaided eye could perceive that particles, very light, were floating. When examined by a microscope the scene was varied in a very high degree—there was evidently organic life. I thought it better to carry the whole to Mr. Dancer and to leave him to do the rest, as my knowledge of microscopic forms is so trifling compared to his.—*Chemical News.*

THE FORMER RANGE OF THE REINDEER IN EUROPE.

By W. Boyd Dawkins, M.A., F.R.S., F.G.S.

(*Concluded from* p. 251.)

In Siberia, Admiral von Wrangel writes*—"The migrating body of reindeer consists of many thousands, and though they are divided into herds of two or three hundred each, yet the herds keep so near together as to form only one immense mass, which is sometimes from fifty to a hundred wersts (or thirty to sixty miles) in breadth. They always follow the same route, and in crossing the river Aniuj, near Plobischtsche, they choose a place where a dry valley leads down to a stream on one side, and a flat sandy shore facilitates their landing on another. As each separate herd approaches the river the deer draw more closely together, and the largest and strongest take the lead. He advances closely followed by a few of the others, with head erect and apparently intent on examining the locality: when he has satisfied himself he enters the river, the rest of the herd crowd after him, and in a few minutes the surface is covered with them." There could not fail to be many casualties in a vast migratory body such as this, and doubtless even were the hunter, and the animals that invariably prey upon such a herd, absent, many of the weaker animals would be swept down by the current and drowned, and their bones would lie in great abundance at some points below the reindeer fords. In this way the vast quantity of the remains of reindeer accumulated at certain points in the ancient river beds, as, for instance, at Windsor, may be accounted for. With the exception of the horse, mammoth, and perhaps the bison, its numbers were larger in post-glacial Britain than any other animal.

In the post-glacial deposits of France it has been found in both caverns and fluviatile sands and gravels; the first record of its discovery is that furnished by M. Guettard from the sands underneath the town of Etampes. Baron Cuvier,† however, with his usual caution, does not absolutely determine the remains to be those of reindeer, but to a very closely-allied animal. He writes with greater certainty about those from the cavern of Breugue, which were associated with the bones of rhinoceros and horse, although he does not actually make up his mind on the point. Subsequent discoveries

* 'Siberia and Polar Sea.' Trans. by Major Sabine, 1840; 8vo, p. 190. A werst is about two thirds of an English statute mile. There must be some mistake in this estimate of breadth; for no observer could see a body of deer of that width in a country so full of ups and downs as that of the Aniuj. The numbers must have been incalculable.

† 'Oss, Foss.,' tom. iv. 4to, 1825.

have put the question beyond all doubt. The animal also occurs in the cavern of Ballot, near Chatillon, sur Seine in the Côte d'Or, and the environs of Issoire, in the Puy de Dome.* The extreme southern range of the animal in post-glacial times is the Spanish side of the Pyrenees, where it has recently been discovered by M. Lartet. In Belgium it occurs in the caverns of Liege, and in Germany in that of Gailenreuth.

Recent discoveries in Central France have established the fact that towards the end of the post-glacial epoch the characteristic post-glacial mammals began to disappear. The tichorhine and leptorhine rhinoceros and the *Elephas antiquus* departed from the soil of France, and were replaced by the ibex, chamois, and the antelope of the Siberian steppes (*A. Saiga*). The cave lion, however, still lingered on, and the mammoth afforded food to the hunter, and has been handed down to us in an engraving on one of its own tusks. The reindeer were so abundant at this time that the epoch has received the name of the Reindeer Period. It formed the principal food of the cave dwellers on the banks of the Dordogne and the Vezere, who in habits and mode of life more closely resemble the Esquimaux than any other folk living on the face of the earth. Probably the post-glacial continent had been depressed before this epoch, and England insulated from the mainland, as neither the man of the period nor the chamois, ibex, or antelope have been found in our islands. Had there not been some natural barrier those animals would probably have crossed over, for in other respects the post-glacial fauna of France is identical with our own. The date therefore of our insulation would be anterior to the immigration of those animals into France. But however this may be, there is not the slightest doubt that the Reindeer period, or the last phase of the great Post-glacial epoch in France, is unrepresented on this side the channel.

We have now to discuss the range of the animal in Pre-historic times. While our estuaries were being silted up, and the alluvia at the mouth of our rivers were encroaching on the domain of the sea, and our peat bogs were being formed, the reindeer struggled for life in Britain with the red-deer. The relative numbers of these two animals in the two epochs is very significant. During the arctic severity of the post-glacial climate, the remains of the red-deer were rare, while those of the former animal were most abundant. During the Pre-historic period the red-deer gradually increased in numbers until the reindeer at last became extinct.

* Gervais, 'Paléont. Franç.' 4to, 1859.

In its rarity in the latter epoch we have proof of the great climatal change that had taken place in France and Britain. It has, indeed, been found only in some eight or nine places in the United Kingdom. Professor Owen figures, in his *British Fossil Mammals*, fig. 197, a skull with antlers from a subturbary deposit in Bilney Moor, near East Dereham, in Norfolk. He also gives a figure of a metatarsal bone in the fens of Cambridgeshire. A third case was afforded during the excavation at Crossness Point, on the south side of the Thames, near Erith, which was made for the reservoir of the southern outfall of the metropolitan sewage. A fine antler was obtained from the bottom of a layer of peat varying from five to fifteen feet in thickness, along with the remains of beaver and a human skull. This is the only instance that has come before my notice of the association of reindeer with man in any British pre-historic deposit. A tracing of an antler sent me by Mr. Tiddiman, of the Geological Survey of Great Britain, brings the number of cases of its occurrence in England up to four. The original was found in a shell marl underlying the peat near Whittington Hall, in Lancashire. Nor was it more abundant in Scotland. In 1775 some antlers were found by Professor Ramsay,* Professor of Natural History in Edinburgh. In 1833 antlers also were obtained from the alluvium of the Clyde, along with a skull of the great urus. Had it not been for the attention of Mr. Smith, of Jordan's Hill, in preserving them until Dr. Scouler† put them on record in 1852, the discovery would have been lost to science. In 1865 Sir Philip Egerton met with a small fragment of antler in the peat bogs of Ross-shire which beyond all doubt belonged to this animal.

The first instance of its occurrence in Ireland is afforded by some sketches of antlers found in 1741, in the bog of Ballyguiry, by Major Quarry, which have been in the possession of that gentleman's family ever since. In the preface to the 'Zoologist' for 1836, the animal is recorded from Lough Gur, in the county of Limerick. In 1847 Mr. Oldham (now Dr. Oldham), brought before the notice of the Royal Dublin Society the "skull, horns, and lower jaw of a reindeer found by Mr. Moss at Ballybeta, near the Golden Ball, in the county of Dublin;" but the most remarkable discovery was that of a perfect skull and antler brought before the Royal Dublin Society by Dr. Carte in 1863.‡ The antlers are quite perfect, and are still attached to the

* Pennant, 'Quadrupeds,' vol. i, p. 100. 4to.
† 'Edinburgh New Philosophical Magazine,' 1852, vol. lii, p. 135.
‡ 'Geol. Mag.,' vol iii, No. xii, p. 546.

skull. The discovery was made in 1861, on the verge of the Curragh bog, near Ashbourne, in the county of Dublin. It is, beyond all doubt, the most magnificent specimen of reindeer that has ever been found in the fossil state. Dr. Carte also mentions three antlers which were found at Coonagh, on the south side of the Shannon, in county Clare. Thus in Ireland, also, the animal was rare, as compared with the Irish elk, or the *Bos longifrons*.

In the pre-historic deposits of Germany the remains of the animal have also been found. Professor Nillson quotes them from the peat bogs of Pomerania, in which they are very abundant (*An. Mag. Nat. Hist.*, Ser. 2, vol. iv., 1849, p. 264), and doubtless they will be found in many other localities as attention is more concentrated on the pre-historic animals. In southern Germany, Dr. Oscar Fraas describes a very interesting refuse-heap at Schussenried, in Upper Swabia, in which the remains of reindeer were associated with those of the bear, glutton, and arctic fox, and large quantities of flint implements of the unpolished kind. In Switzerland its bones have been found in a pre-historic cavern at l'Echelle,* near Geneva, in association with worked flints, and the remains of the ox and horse. Thus scanty is the evidence of the existence of the animal in pre-historic times, but it is sufficient to prove that it still lingered in regions far to the south of its present habitat.

If we turn to history we shall see that the animal has been retreating northwards at least during the last two thousand years. In Cæsar's time it dwelt in the great Hercynian forest that overshadowed Germany. He describes it as† "an ox in the shape of a stag," and as "having one antler springing from the middle of its forehead, between the ears, loftier and more directed forwards than any known to the Romans. From its palm-like top, branches spread widely. In both male and female there is the same nature—the same form and magnitude of antlers." This description has been considered by many of no value at all, and as the pure invention of Cæsar's brain. It seems to me, however, a very natural explanation of the difficulties of the passage, if we suppose that Cæsar described the animal partly from hearsay and partly from a rude sketch in profile. In the latter

* Lubbock, 'Pre-historic Man.'

† 'De Bello Gallico,' lib vi., cap. xxvi.—"Est bos cervi figura, cujus a media fronte inter aures unum cornu exsistit, excelsius, magisque directum his quæ nobis nora sunt cornibus. Ab ejus summo, sicut palmæ, rami quam late diffunduntur. Eadem est fœminæ marisque natura, eadem forma magnitudoque cornuum."

case, unless the drawing were in correct perspective the animal would appear to be possessed of one horn only, and therefore he might legitimately describe it in times when a belief in all kinds of monsters was current, as possessed of one horn. To this imperfection of drawing many of the monsters in the natural history books of the middle ages may most probably be traced. It is not at all reasonable to suppose that Cæsar himself ever saw a reindeer; for he describes the Hercynian forest as stretching far beyond his ken, and then he proceeds to enumerate the animals that are found in it. The Germans, however, in his time were well acquainted with the reindeer, for in the twenty-first chapter of the sixth book of his 'Commentaries' he writes that they use small skins of reindeer, "Parvis rhenonum tegimentis utuntor,"—a passage in which rhenones is the latinized form of the word that is now current as Rennthier (Swedish Rendjur), and which is preserved in the Romance word Renne, the root meaning being found in the German rennen, to run.* When the Teutonic invaders of Europe advanced northwards and westwards in the Hercynian forest, they met with an animal altogether strange to their eyes. They were struck with its running powers, and so they termed it the "running beast," and thus the animal acquired a name. Other writers of antiquity, such as Pliny, Solinus, and Ælian, speak of an animal which they term tarandus; their accounts, however, are purely mythical, and it may have been an elk, or, as Gesner believes, a Polish thur, as reasonably as any other animal.† In Cæsar's description the uprightness of the horns shows that he meant the true reindeer, and not the elk.

Down, indeed, to the sixteenth century, Cæsar's account is not surpassed for accuracy by any other, but for the most part formed the basis of all the descriptions of the animal written by the mediæval monks. In the thirteenth century Albertus Magnus, Bishop of Ratisbon (died 1280), describes the animal as possessed of three horns; and Olaus Magnus,‡ writing nearly three hundred years afterwards, adopts his error. He writes that, "in the north, on both sides of the Gulf of Bothnia, and in Lapland, there is an animal with three horns (*bestia tricornis*), one of the stags, but taller,

* That this is the true derivation is proved by the prominence which Olaus Magus, Albertus Magus, and Gesner give to its attribute of swiftness. Dr. Lee derives the name from the German *rein*, clean, without however giving any reason.

† 'Historia Naturalis,' folio, 1603, vol. i. p. 140.

‡ 'Gentium Septentrionalium Historiæ,' lib. xvi, cap. viii.

stouter, and swifter. Two of the horns are larger than the rest, and situated in the same place as in the red-deer, but they are more branching and more widely extending, even to the extent of fifteen tynes. There is a third horn in the middle of its forehead, with other shorter tynes surrounding it." At this time he was Archbishop of Upsal and primate of the Goths and Swedes, and therefore ought to have known something about the animal that lived in his own jurisdiction. Besides this erroneous description, he actually figures the animal with three horns. It is clear, from the 'History of Lapland,' by John Scheffer,* that he was in the habit of visiting the northern parts of his diocese, and if so he must have seen the animal with his own eyes. He seems, however, to have prefered the testimony of another bishop, who lived in a country where the animal did not exist. On the whole, a more untrustworthy writer than this archbishop perhaps never wrote a book, for he has not only believed every one of the myths current in his day, such as griffins, sea-horses, whales swallowing ships, and the like, but he has even given woodcuts of them, which have not the slightest foundation in fact.

We come now to a notice of the animal which has certainly not met with the attention it deserved in England. In the 'Orkneyinga Saga' the reindeer is incidentally mentioned; the passage is thus translated by a learned Icelander, Jonas Jonæus,† "Solebant comites quavis fere æstate in Katenesum transire, ibique in desertis *feras rubras* et *rangiferas* venari." The Jarls of Orkney were in the habit of crossing over to Caithness every summer, and there hunting in the wilds the red and the reindeer.‡ Torfaeus, writing at the end of the seventeenth century, has translated "rauddyri," by capreæ, or goats, and his mistake has been followed by Dr. Flemming,§ who quoted him without consulting the original. Dr. Hibbert,‖ however, has given an elaborate critique on the disputed passage, and agrees with Jonæus in believing that the reindeer was hunted in Scotland by the Jarls of Orkney in the twelfth century. Professor Brandt of St. Petersburgh, is also of the same opinion. The authors of the

* 'Lapponia.' 4to, 1673.

† He published in 1780 an abstract and Latin translation of the "Saga." The passage in the original is as follows: "That var sithr Jarla nær hvert sumar at fara yfer á Katanes oc thar upp á merkr at veida *randdyri* edr hréina." The two Jarls in question, Ronald and Harold, hunted in Caithness, according to Jonæus, in 1159.

‡ 'Rerum Orcad. Hist.' lib. i. cap. 36.

§ 'British Animals.' 1828. 8vo.

‖ 'Brewster's Edinburgh Journ. Sc.,' New Series, vol. v, p. 40.

'Saga' must have been well acquainted with the animal in Norway, Sweden, and Iceland; and there seems to me nothing improbable in the natural inference that the animal they called reindeer was undoubtedly one. There is not the slightest record of the animal having lived in historic times in England or Wales. The Romans never conquered Caithness, and the highlands of Scotland were so utterly unknown to the English of the middle ages, that even so late as the time of William III they were looked upon very much as we now look upon the extreme north of Lapland. In this way the absence of any historical notice of the animal may be accounted for. The inclement hills of Caithness lie in the same parallel of latitude as the south of Norway and Sweden, in which the animal was living at the time. Reindeer moss is very abundant for the animal to eat, and the only condition of life which is wanting to make that country still habitable by it is a greater severity of cold. I feel disposed, therefore, to admit the fact that the reindeer lived in Caithness at the time that Henry II occupied the throne of England, and Alexander Neckam was writing his 'Natural History.' There is also another point which is well worthy of notice. The animal is mentioned in the 'Saga' along with "the red-deer." At the present day they occupy different zoological provinces, so that the fact of their association in Caithness would show that in the twelfth century the red-deer had already appropriated the pastures of the reindeer, which could not retreat further north on account of the sea. Hence the association of these animals in the same area proves that the latter was verging towards extinction. The exact date of the disappearance of the reindeer from North Germany and the district to the south of the Baltic is not known; according to Partholinus, it had deserted Denmark before the year 1671. From Linnæus' time down to the present day, even in Sweden and Norway it has been retreating further and further north.

We have thus traced the range of the animal in Post-glacial and Pre-historic times, down to the present day. During the Post-glacial period it dwelt, as we have seen, throughout Europe north of a line passing through the Alps and Pyrenees, in vast herds, associated with the cave hyæna and tichorhine rhinoceros. During the Reindeer epoch it lived also in vast herds in France and Belgium. In Pre-historic times it is found sparingly in Britain, Switzerland, and abundantly in the north of Germany. When Cæsar wrote his 'Commentaries' the animal had left Gaul and taken shelter in the great Hercynian forest. Before his landing in Britain it had most likely departed from the whole

of the island which subsequently formed the province of Britannia. If this did not take place before the Stone or Bronze age in Britain the animal must have been very rare, for while the other objects of the chase are represented by vast quantities of bones in the tumuli and villages, not the least trace of it has yet been found. It most probably, therefore, had taken refuge in the inclement hills of Caithness before the commencement of history in Britain. There it lingered on, struggling for life with the red-deer until, towards the end of the twelfth or the beginning of the thirteenth century it became extinct. In Germany, also, it seems to have retreated, and taken refuge in Pomerania and Denmark in the middle ages. In the middle of the seventeenth century it could no longer live in Denmark,* and at the present day it has found uncertain resting places in the north of European Russia and the mountains of Scandinavia, where it is daily becoming rarer, and daily seeking refuge from the hunter by a retreat northwards towards the shores of the great northern sea, and westwards towards the great Siberian tundras.

Nor, indeed, can reindeer be induced to live in the countries which were formerly their own. The Duke of Athol† attempted to reintroduce them into Scotland without success, and even an attempt made to naturalize them in Denmark, in the first half of the eighteenth century, failed.‡ In Cassel also, Dr. Zimmermann§ writes, that they were kept in a park; but in no case on record in any of these countries have they propagated their kind. Without exception, all have died barren. The reason, therefore, of their northern retreat, cannot be the dread of the hunter, as has been suggested, for all possible pains were taken to preserve them. The red-deer, moreover, would not have thriven and multiplied in the countries which they deserted, for the flesh of the former is, if anything, better than the flesh of the latter, and the former is quite as easily captured as the latter. We must seek, therefore, a far deeper cause. No one would dispute the intense cold of the Glacial, or the severe climate of Central and Western Europe in Post-glacial times, during which the reindeer was so abundant; but many would be inclined to deny the gradual amelioration of our climate in the Pre-historic and Historic eras. That, however, the climate has changed since Cæsar's day is proved by the concurrent

* 'Acta Hasnens,' 1671.
† 'British Animals,' Flemming. 1828.
‡ 'Œuvres de Reynard,' tom. i. Paris, 1750.
§ 'Specimen Zool. Geograph.' 4to, 1777, p. 283.

testimony of Buffon, Zimmermann, and Gibbon.* The German invaders of the Roman empire transported their numerous armies, their cavalry and heavy waggons, over the Rhine and Danube, on a vast and solid bridge of ice. On the banks of the Danube the wine, when brought to table, was frequently frozen. Thus we have clear historical proof that the climate of Germany, in the days of Ovid, Virgil, Herodian, and Diodorus Siculus, was much more severe than it is now. We therefore not only know that the reindeer existed in Germany in those times, but that the physical conditions also were, to a certain extent, of an arctic character. Coincident with the climatal change that has taken place since that time is the migration of the reindeer to the north and east.

The date of the disappearance of the reindeer from any given country affords us an index to the climate at the time. Long before Cæsar landed on our shores the arctic conditions favourable for their life had vanished away. When Cæsar wrote his 'Commentaries' they were still to be found in the north of the great Hercynian forest. They had already departed from the low country of Gaul. During the middle ages the climate gradually changed in Germany, until, in the middle of the seventeenth century, the reindeer had even forsaken Denmark. In Caithness, however, the most northern and inclement portion of our island, hemmed in on the one hand by the sea, and on the other by the continually encroaching herds of red-deer, they lingered long after they had disappeared from Gaul, until at last they became extinct, probably about the beginning of the thirteenth century. The cause of the gradual amelioration of climate in modern times is generally attributed to the draining of morasses and the cutting down of the forests. On this point, however, the former range of the reindeer gives most conclusive testimony. Before the hand of man had made any impression on the vast forests that overshadowed Germany and Britain the animal had commenced its northward retreat, and therefore the climatal change must have been going on at that time. We cannot therefore ascribe the change to the industry of man, but to some great cause operating through an inconceivably long time, from the Glacial epoch of intense arctic severity down to the temperate climate of the present day. It is indeed but a return to the order of things in Pre-glacial times. The Glacial epoch came in abnormally, so to speak, disturbing the temperature of the northern hemisphere, and driving the animals that dwelt in that area before it. It

* 'Decline and Fall of Roman Empire,' cap. ix.

lasted an inconceivably long time, so long, indeed, that very many of the European pre-glacial animals became extinct, and it left its impress in the presence of the musk, sheep, reindeer, marmot, and lemming, among the post-glacial mammals. As the climate became warmer they disappeared, and had not the hand of man intervened, there is every probability that the wild animals of a far more southern character would now be living in Europe, such as the common hyæna and the lion. The cause of the great refrigeration of our climate is still unknown; but the most philosophical explanation is that brought before the Royal Society, in 1866, by Mr. John Evans, F.R.S., viz. the alteration of the earth's axis of rotation, consequent on the elevation or depression of some part of its crust, which must necessarily destroy the equilibrium.—*Popular Science Review.*

Translations and Reviews of Continental Veterinary Journals.

By W. Ernes, M.R.C.V.S., London.

EFFECTS OF HIGH TEMPERATURE ON TRICHINA SPIRALIS.

At a meeting of the Imperial and Central Veterinary Society, on the 14th of November, 1867, president M. Goux, the secretary read the following communication from MM. Fjord and Krabbe, Professors in the Veterinary School at Copenhagen.

Sir,—Being acquainted with the discussions which have taken place in the Imperial and Central Veterinary Society on the subject of the temperature necessary to kill Trichinæ, and of that required by the meat in its preparation for food, we beg you to communicate to the society the researches we have made on this subject at the Royal Veterinary School at Copenhagen. These researches have already appeared in the "Tidskrift for Veterinairer," 14th volume, 1866, from which we give the following extract, and at the same time we may observe that similar experiments had been previously made by Küchenmeister and Fiedler at Dresden. In relation to the effect of heat on trichinæ, a temperature of 62 to 75 Centigrade has generally been stated as necessary to remove all danger, but very often it has not been said how these conclusions were arrived at. The most exact experiments made on the subject, especially those of Dr. Fiedler, show

that the degree of heat which kills the trichinæ has been put somewhat too high. This learned experimentalist ascertained the fact that the parasites were still living after having been submitted to a temperature of 52° 5′, and that for certain they were dead at the temperature of 62° 5′, and further, that in a great many cases, they were killed by a temperature of 56°. His manner of proceeding was as follows. After having immerged pieces of meat infected with trichinæ for ten minutes in water of which the temperature was accurately determined, he ascertained whether they were alive or not by finding out whether they yet possessed any motion, or by making some rabbits swallow the meat.

"It is, however, possible that diverse circumstances might cause the trichinæ to be more or less in a state to resist the effects of a higher temperature, although there was reason to suppose from the researches of M. Fiedler that the degree of heat to which they would succumb is between 52° 5′ and 62° 5′. To verify this, one of us (M. Krabbe) made a series of experiments with the flesh of the pig, and the rat affected with trichinæ by cutting it into small pieces, and immersing it for a space of time, varying from five to thirty-five minutes, in hot water, the heat of which was so regulated as not to vary more than half a degree from the temperature fixed upon. The examinations always took place the same day to see if, after having removed the trichinæ from their capsules, and warming them, it would be possible to perceive any motion.

"On the 28th of March, 1866, pieces of the muscle of a pig which contained encysted living trichinæ, but not very numerous, were kept in water of 50°, 54°, 57°, and 62° 5′ Centigrade, for the space of thirty minutes. In the first case (50°) the trichinæ still gave some signs of life, but in the other cases they had all perished.

"On the 29th of March, the flesh of some rats infected with trichinæ was plunged for thirty minutes in water heated to 50°, 54°, 57° 5′, and 60°. Life was only observed in those which had been exposed to the temperature of 50°.

"On the 5th of April the same experiment was repeated with the flesh of the rats affected with trichinæ, by plunging it in water heated to a temperature of 52° 5′ and 60°, during five, ten, and twenty minutes at 52° 5′. A certain number were still alive after five minutes, and some of them made feeble movements after ten minutes of immersion, but those which had remained in the water twenty minutes did not give the slightest sign of life, nor did those which had been heated to 60°.

"On the 6th of April some pieces of the flesh of the same rats were heated to 55° and to 57° 5′, for the space of five, ten, and twenty minutes, but no movements of the entozoa were observed in either case.

"On the 26th of April some fresh experiments were made with some pork which contained a great number of trichinæ by submerging it during five, ten, and fifteen minutes in water heated to 51°, 54°, 59°, and 61°. At 51° the trichinæ were always found alive; at 54°, after five minutes, they were also alive; at 59° and 61° they gave no sign of life even after five minutes' immersion.

"On the 27th of April, some flesh of the same pig was put in water for thirty minutes, heated to 51° and 52° 5′; and only in the first instance were the trichinæ found to be alive.

"On the 28th of April some more flesh of the same pig was heated during twenty minutes to 51°, and for fifteen minutes to 52° 5′. The trichinæ were found alive, but when the temperature was raised to 56° and 62° 5′ they were found dead at the end of five minutes.

"These divers experiments are shown in the following summary:—

Temperature.	*Duration of the Heating Process.*				
	5 minutes.	10 minutes.	15 minutes.	20 minutes.	30 minutes.
50° Cent.	Alive	Alive	Alive	Alive	Alive
51° ,,	,,	,,	,,	,,	,,
52·5° ,,	,,	,,	,,	Dead	Dead
54° ,,	,,	Dead	Dead	,,	,,
55° ,,	Dead	,,	,,	,,	,,
56° ,,	,,	,,	,,	,,	,,
57° ,,	,,	,,	,,	,,	,,
59° ,,	,,	,,	,,	,,	,,
60° ,,	,,	,,	,,	,,	,,
61° ,,	,,	,,	,,	,,	,,
62·5° ,,	,,	,,	,,	,,	,,

"To be quite sure that the trichinæ were dead by an exposure to a temperature of 56° the following experiments were made with the flesh which had been exposed to those degrees of heat.

"Half a kilogramme of ham containing trichinæ was cut into small pieces, put in a pot and heated by pouring water on them of a gradually increasing temperature, taking care to agitate it with a thermometer until the water had acquired 56°; it was then allowed to stand for two hours, until the thermometer fell to 37°. The ham was then distributed in

portions of 125 gr. to four rabbits, which they were made to swallow on two consecutive days. At the end of eight days a small quantity of the flesh of a pig infected with trichinæ, which had been heated in the same manner to 56°, was also administered to two of the above-mentioned rabbits. When the four rabbits were examined fifteen and thirty days after no trichinæ were found in their muscles.

"Another analogous experiment was made with the flesh of a pig strongly infected with trichinæ. 240 grs. of the shonlder containing completely encysted trichinæ were heated in a saucepan on a gas-stove, until the thermometer rose to 56°, which took place in about twenty minutes, and after having been kept at that temperature for ten minutes, the flesh was given on the same and the two following days to two rabbits in the proportion of 125 grs. to each, which probably, at an approximate guess, contained some 20,000 trichinæ. On examining the rabbits twenty-four and twenty-five days after no trichinæ were found either in the muscles or the intestines.

"These experiences confirm that which might have been presumed from the former experiments, viz., that the trichinæ cannot support for any length of time a temperature of 56° Centigrade.

"The temperature of the interior of a piece of meat may be easily determined, at any part of it, by a small mercury thermometer, protected by a glass tube. These are easily procured at the optician's. One with a small bulb and thin tube can be easily inserted into a piece of meat, either before or after cooking, without it being necessary to make any other opening than a small cut on the surface, even when the meat is hard, as in the case of raw smoked hams. When the thermometer is placed in the meat, it always indicates the temperature at the spot where the bulb is even if the experiment is performed in boiling water. It is, however, an apprehension that the part of the tube which is surrounded by the boiling water might possibly measure the temperature, but glass being a bad conductor of heat, and the meat contracting so much round the bulb, these two causes of apparent error have very little influence on the results. For instance, before submitting a piece of meat to the high temperature, several thermometers were placed in it, in divers places and at different depths, leaving them in the meat during cooking, but it was found that they stood at different degrees, according to the depth of their bulbs in the meat, and in proportion as they were placed more or less central. Other thermometers which had been inserted during the cooking

at the side of the former, and exactly at the same depth, and at equal distances, indicated the same degree of heat as those which had been inserted previously. These experiments were repeated several times. They sometimes, however, presented some slight variations, but these were evidently from the difference of the temperature in the meat itself, which was sometimes higher or lower, and which no doubt in performing these experiments cannot always be accurately measured.

"In the following experiments made by M. Fjord the temperature was always ascertained in different parts of the meat by means of thermometers constantly kept in the same place, the depth being measured on the same scale as before.

"Other thermometers, placed more superficially, indicated a higher temperature, and at the distance 2·5° centimeter from the surface, as much as from 30 to 40; thus, the heat after the meat has been removed from the fire continues to penetrate for some time from the surface to the centre, and taking this increase of heat into account, we arrive at a temperature as high as 70°, which exceeds by more than 14° that which has been shown to be necessary to kill the trichinæ. In cooking bacon in the usual way, for consumption in families, it does not require the same length of time which was necessarily employed in these experiments, but as it is possible that large-sized hams are not boiled a sufficient time, it is to the general interest to determine the necessary time for boiling. Experience proves that the time of boiling must be regulated according to the weight of the hams, and their temperature when put on the fire, for the degrees of heat of the meat rise a certain number every half-hour, soon after the water enters into ebullition, 13° for the first hour, 11° for the second, &c.; evidently there is more time required to raise the temperature from 4° to 64° than from 14° to 64°, or in other words, it takes longer boiling in winter than in summer; moreover, the ham receives a certain amount of heat from the water before it has attained the boiling point, and this degree of heat is pretty well equal to half that of the boiling water. The above experiments with many others show that for the same initial temperature the time for boiling should be in proportion to the weight of the ham, and that it may be estimated at from thirty to thirty-six minutes for every half kilogramme, according to the temperature of the latter—17° (in summer), and 7° (in winter)—deducting from this the half which is necessary for the water attaining the boiling point. A ham weighing five kilogrammes with an initial temperature of 7° ought,

therefore, to be boiled thus $36 \times 5 = 3$ hours, if put into boiling water, but only two and a half hours if put in cold water, even if it should require an hour before the water enters into ebullition. In following this rule a temperature of 60° at least is always attained by the meat during the process of boiling, after standing an hour that of 70°. The numerous means taken for the boiling and baking of hams have always given this last degree of temperature. 70° is precisely the degree at which the blood coagulates, and fresh meat loses its red colour; consequently, when the roasted meat is no longer red, and no gravy of that colour comes out of it, one may be perfectly satisfied as to the trichinæ not being alive. The time to roast meat has also been measured, but as it varies very much in accordance with the process of roasting either in the oven or before the fire, and the latter being more or less keen, we have not stated it. When the meat is cut into slices or steaks, it is equally easy to ascertain the temperature, the slices being in general thick enough to admit of the bulb of the thermometer; if not, one can wait until they are done, and two thermometers can be placed against each other; in the first case the experiment can be made either while the slices are broiling, or after they are taken from the fire, and put on a plate. Cutlets, as they are cooked in families, have always marked a higher degree of temperature than 60°, and slices of bacon more than 90°. These experiments are simple enough, and any cook can easily perform them by means of a small thermometer.

"Other experiments show that the time of cooking meat might be much shortened by leaving it in the hot water and placing the vessel in a basket filled with hay or any other material which would confine the heat. Thus, for instance, a ham weighing seven kilogrammes, after being boiled for three quarters of an hour, was left for six hours in the hot water, by which it had acquired a temperature of 76°, and proved to be perfectly done. It has been also ascertained by the same experiments that it matters not if the water ceases momentarily from boiling, but it is essential that the meat should be always completely covered."

N. J. Fjord,
Professor of Clinic;
Doctor Krabbe,
Assistant Professor of Anatomy.

ROYAL COLLEGE OF VETERINARY SURGEONS.

QUARTERLY MEETING OF THE COUNCIL, HELD APRIL 1ST, 1868.

PRESENT:—The President, Professor Spooner, Messrs. Broad, J. C. Broad, Cowie, Ernes, Fleming, Goodwin, Gowing, Greaves, Harrison, Harpley, Hunt, Lawson, Mavor, Wilkinson, Withers, and the Secretary.

The President in the Chair.

The minutes of the preceding meeting were read and confirmed.

A letter was read from Mr. George Fleming, of the Royal Engineers, Chatham, expressive of his wish to present to the Museum of the College some horse shoes and a "shod-hoof" from Syria and Egypt. The specimens were laid on the table.

It was moved by *Professor Spooner* and seconded by *Mr. Hunt*—

"That a vote of thanks be given to Mr. Fleming for his presentation."—Carried.

The letter to Dr. J. W. Begbie, one of the Members of the Scotch Board of Examiners, was then read, in which the Council expressed their regret at his intended resignation, also Dr. Begbie's reply, thanking the Council for their kind appreciation of his services, and regretting that the demands of his own profession left him so little time for the satisfactory discharge of any other engagements.

Dr. J. W. Begbie's resignation having been accepted,

A letter addressed to Professor Syme, the Chairman of the Scotch section of the Board of Examiners, was read, requesting that he would name some eminent member of the College of Physicians whom he would wish to have associated with him at the chemical table, and also that gentleman's reply, mentioning Dr. Alexander Crum-Brown, of Edinburgh, as being well qualified to fill the position.

The election of a member of the Scotch section of the Board of Examiners to fill the vacancy occasioned by the resignation of Dr. J. W. Begbie was then proceeded with.

It was moved by *Mr. Lawson* and seconded by *Mr. Cowie*—

"That Dr. Alexander Crum Brown be elected to fill the vacancy caused by the resignation of Dr. J. W. Begbie."

On the ballot being taken, Dr. Alexander Crum-Brown was declared to be unanimously elected.

The subject of the forthcoming examinations was then considered.

A letter from the Principal of the Royal Veterinary College, announcing the number of candidates for the diploma of the Royal College of Veterinary Surgeons, was then read. Also the correspondence received from Dr. Taylor and Dr. Sharpey in reference to the most convenient time for the examinations to take place.

Letters were read from Dr. Dunsmure, of Edinburgh, and Dr. John Struthers, of Aberdeen. Also from the Secretary of the Edinburgh Veterinary College, and Professor M'Call, Principal of the Glasgow Veterinary College, in reference to the time of the examinations being held in Edinburgh.

It was moved by *Mr. Ernes* and seconded by *Mr. J. C. Broad*—

"That the London examinations commence on the 20th of April and be continued to the 2nd of May, and that the Scotch examinations take place on April 16th and following days."—Carried.

A letter was then read from Mr. T. M. M. Connell, of Wigtown, who holds the Highland Agricultural Society's Certificate, expressing a desire to present himself at the next Special Meeting of the Veterinary Board of Examiners in Edinburgh.

The Secretary was instructed to inform Mr. Connell that a Special Meeting of the Veterinary Court of Examiners would be held in Edinburgh at the Freemason's Hall, on Friday April 17th, and advising him to place himself in communication with Mr. John Lawson, of Manchester, one of the Examiners.

The President drew the attention of the Council to the Certificate required from the students of the Albert Veterinary College who were candidates for examination, as to whether, during the absence of Professor Gamgee, any one else was entitled to grant certificates.

After some discussion—

It was decided that a certificate from some of the teachers in that school should be accepted.

The Registrar reported the following deaths, viz.: Mr. Joseph Laver, of Somerton, diploma dated December 15th, 1836; Mr. John Harris, of Preston, diploma dated May 17th, 1828; Mr. George Houston, of Dalkeith, diploma dated April 24th, 1844; Mr. Andrew Edmonston, of Aberargie, diploma dated April, 1835; Mr. John Bissett, of Montrose, Forfarshire, diploma dated April 17th, 1834; Mr. Thomas A. Murray, of Parsonstown, Ireland, diploma dated April 27th, 1846; Mr. William Litt, of Shrewsbury, diploma dated March 31st, 1841; Mr. Richard Cortis, of Shipton,

York, diploma dated July 1st, 1824; Mr. Walker Watson, of Rugby, diploma dated May 14th, 1857; Mr. Oliver William Brown, of the Royal Veterinary College, London, diploma dated April 22nd, 1867; Mr. John Marshall Wilson, of the Military Train, diploma dated November 16th, 1866; Mr. John Angle, of Tollington Park, London, diploma dated May 15th, 1857; Mr. William Ford, of Biggleswade, Beds., diploma dated February 4th, 1830; and Mr. William Burden, of Southampton, diploma dated May 11th, 1831.

An obituary of the late Professor Brande, D.C.L., F.R.S., by Dr. A. S. Taylor, reprinted from the Proceedings of the Royal Society, was laid on the table for the library of the College, having been sent by Dr. Taylor.

It was moved by *Mr. Wilkinson* and seconded by *Mr. Lawson*—

"That a vote of thanks be given to Dr. Taylor for his presentation."—Carried.

The Registrar informed the Council that there were only 50 copies of the Register left, and that numerous alterations and corrections were required. He also stated that a considerable number of names would have to be added to the list, as well as those of some candidates for the diploma who were about to present themselves before the Board of Examiners.

It was moved by *Mr. Hunt*, and seconded by *Mr. Withers*—

"That a new Register be prepared after the examinations, and that the publication of the same be advertised in the *Veterinarian*. Proofs to be laid before the Council at the next meeting."—Carried.

The Finance Committee reported that the vouchers and receipts of payment during the preceding quarter had been examined and found correct. The quarterly balance sheet of the Treasurer's account was submitted. The present liabilities amounted to £71 5s. 4d., which the committee recommended should be discharged. A balance of £529 4s. 9d. would remain in hand.

It was moved by *Professor Spooner* and seconded by *Mr. J. C. Broad*—

"That the Report and quarterly balance sheet of the Treasurer's account be received and adopted."

Cheques were ordered to be drawn for the current expenses and for the examiners' fees.

The arrangements for the forthcoming Annual Meeting were next considered.

It was moved by *Mr. Harrison* and seconded by *Mr. Hunt*—

"That the President, Professor Simonds, Messrs. Ernes,

Fleming, and the Secretary, be appointed a committee to prepare the annual report."—Carried.

It was moved by *Mr. J. C. Broad* and seconded by *Mr. Greaves*—

"That Mr. Joseph Woodger, Jun., and Mr. Edward Coleman be appointed auditors."—Carried.

The Secretary then read a letter dated 24th January, 1868, received from Mr. Wilkinson, Principal Veterinary Surgeon to the Army, requesting the President's sanction for applying to the Solicitor of the College, W. M. Wilkinson, Esq., for a legal opinion on the subject of the Charter for Scotland.

The Solicitor's reply was then laid before the Council, and also the report from the Parliamentary Committee, including a letter dated February 1st, 1868, addressed by the President of the Royal College of Veterinary Surgeons to His Grace the Duke of Richmond on the subject of the Scotch Charter.

It was moved by *Mr. Wilkinson,* and seconded by *Mr. Greaves*—

"That the Report of the Parliamentary Committee be received and adopted."

The President informed the Council that Messrs. Loch and Maclaurin, the Parliamentary agents, were still watching the proceedings of the applicants for the Charter on behalf of the Council.

The President next introduced the subject of the anniversary dinner, when

It was moved by *Mr. Harpley* and seconded by *Mr. Broad*—

"That the anniversary dinner should take place at the London Tavern, Bishopsgate Street."—Carried.

By order of the Council,

WILLIAM HENRY COATES,

Secretary.

SPECIAL MEETING OF THE COUNCIL, HELD APRIL 15TH, 1868.

PRESENT: The President, Professor Spooner, Messrs. J. C. Broad, Brown, Ernes, Fleming, Gowing, Lepper, Withers, and the Secretary.

The President in the Chair.

The minutes of the preceding meeting were read and confirmed.

A letter was read from Dr. Alexander Crum-Brown, of Edinburgh, acknowledging the honour of his election, and accepting the appointment to the Scotch section of the Board of Examiners.

A letter was also read from Mr. George Fleming, of the Royal Engineers, Chatham, in which he desired "to present to the Museum of the College a curious Japanese horse shoe or sandal, made from rice straw which was in general use in that country."

It was moved by *Mr. Ernes* and seconded by *Mr. J. C. Broad*—

"That a vote of thanks be given to Mr. Fleming for his presentation."—Carried.

Letters were read from Dr. Dunsmure, of Edinburgh, announcing the number of candidates for the diploma of the Royal College of Veterinary Surgeons; and also one in which he stated that Dr. Dalzell had called upon him on behalf of the Principal of the Edinburgh Veterinary College, informing him "that after this year general certificates of attendance would not be granted to students, but each lecturer would give his own certificate, and that if a general certificate were necessary a printed form must be supplied by the Royal College of Veterinary Surgeons."

A letter was then read from Mr. P. Halsey, of Exeter, announcing the death of Professor Morton, which melancholy event had taken place on the 4th instant at his residence, Hill House, Dawlish. Also another which had been received from Dr. A. S. Taylor, regretting the loss of his late colleague, Professor Morton.

The Annual Abstract of the proceedings of the Council, as prepared by the Report Committee, was then read and submitted for approval.

It was moved by *Mr. Broad* and seconded by *Mr. Gowing*—

"That the Report be adopted."—Carried.

The balance-sheet of the receipts and expenditure during the past year as audited was laid on the table.

It was moved by *Mr. Lepper* and seconded by *Mr. Fleming*—

"That the Report be received and adopted."

By order of the Council,

WM. HENRY COATES,
Secretary.

NEW MEMBERS OF THE PROFESSION.

At the several meetings of the Court of Examiners of the Royal College of Veterinary Surgeons, held on April 20th, 21st, and 22nd, the following gentlemen, students at the Royal Veterinary College, London, received the diploma of the College, and were admitted members of the profession:

April 20th.

Mr. Alfred Stevens, M.R.C.S.	Brighton.
— Charles Groves	Hixlade Head, Dorset.
— John Thornton	Croston, Preston.
— James Rowe	London.
— Thomas William Gowing	London.
— John Hatch	Beaconsfield, Beds.
— Horatio William Caton	High Ongar, Essex.
— John Hayward Gould	Southampton.
— Robt. Spooner Hart	London.

April 21st.

Mr. Alfred Withers	London.
— William Brand Garner	St. Ives, Huntingdon.
— Richard Powell Cooper	Great Berkhampstead, Herts.
— John Woodroffe Hill	Wolverhampton.
— Matthew Murphy	Dublin.
— William Cleophas Barling	Newnham, Gloucester.
— Alfred Sharp	Grampound, Cornwall.
— Abraham Green	Stourbridge, Worcester.
— Richard Howard	Thetford, Norfolk.
— John William Gresswell	Great Steeping, Spilsby.
— Thomas Ellrington Smith	Louth, Lincolnshire.
— George Cave	Liverpool.

April 22nd.

Mr. Benjamin Biles Aubrey	Salisbury.
— Frederick Wattam	Stamford.
— Stephen Knott	Portsmouth.
— Thomas William Beach	Great Barford, Beds.
— George Frederick Rose Vincent	Needham Market.
— Waller Wilkinson	Newcastle-on-Tyne.
— George Carless	Stafford.
— Jeremiah Washford	Kingsnorth, Ashford.
— Alfred Arton Keeble	Leeds.

At a special meeting of the Court of Examiners, held on the 21st, in accordance with the Resolution of the Council for the admission of candidates holding the Highland and Agricultural Society's certificate—

Mr. Thomas Paton . . . { Cape Mounted Riflemen, King William's Town, Cape of Good Hope,

was admitted a member of the body corporate.

At the meetings of the Court of Examiners of the Royal College of Veterinary Surgeons, held in Edinburgh, the following gentlemen, students of the Edinburgh and Glasgow Schools, passed their examinations and received the diploma of the College:

April 16*th*.

Mr. John Pettigrew Prentice	Glasgow.
— Robert Mitchell	Glasgow.
— John Mair	Murmains, Douglas.
— James Marshall	Dungannon, Co. Tyrone.
— James Weir	Airdrie, Lanark.
— James Ritchie	Kincaldrum, Forfarshire.
— James Clark	Hawick, Roxburgh.

April 17*th*.

Mr. John Cameron	Maryculter.
— Michael J. Hartigan	Limerick.
— Joseph Lay Faulkner	Wetherby, Yorkshire.
— Jonathan Bunnell	Liverpool.
— Jonathan Midgley	Everingham, Yorkshire.
— Charles Baxter Bostock	Manchester.
— James Black Taylor	Aberdeen.
— William Temple	Chester-le-Street, Durham.
— Robert Walker Murdoch	Cupar, Fife.
— John B. McGregor	Crieff.
— George T. Patterson	Wooler, Northumberland.
— Frederick William Going	Mullinahon, Co. Tipperary.

April 18*th*.

Mr. George Aitken	Dalkeith.
— John Grant	Fyvie, Aberdeenshire.
— George Lawson	Countesswells, Aberdeenshire.

At a special meeting of the Court of Examiners, held in Edinburgh, April 17th, in accordance with the Resolution of the Council for the admission of candidates holding the Highland and Agricultural Society's Certificate, the following gentlemen received the diploma of the College, and were admitted members of the body corporate.

Mr. Thomas Macmillan M'Connell	Torr House, Wigtown.
— John Hammond	Newton-Stewart.

[In our next we hope to give the names of the other successful candidates for the diploma of the College. We have been unable to complete the list in our present number, in consequence of the examinations extending to the 1st of May.]

GLASGOW VETERINARY COLLEGE.

PRESENTATION OF A TESTIMONIAL TO PROFESSOR ARMATAGE.

A MEETING of the students of the above institution was held in the lecture room on the 17th ult., when a testimonial was presented to Professor Armatage.

Mr. W. R. Gilligan, being deputed by the donors, addressed Mr. Armatage in a short but expressive speech, in which he referred to the advantages the students had derived from the attention displayed by Mr. Armatage on their behalf, and their regret that he had felt it desirable to resign the Professorship of Anatomy and Physiology in the College. Mr. Gilligan concluded by handing to Mr. Armatage a massive gold Albert chain, which he presented in the name of his fellow-students, and with the hope that it would be received as a *souvenir*, and although a small, still an honest estimate of the value placed upon his endeavours.

Mr. Armatage, in reply, alluded to the pleasure which he derived from the assurances of his usefulness to the veterinary student, as conveyed by Mr. Gilligan on behalf of those present, and stated that, although his connection with the Glasgow Institution might be virtually considered as closed, his interest in the education of the veterinary student would not be diminished thereby. In whatever capacity he might be placed hereafter, he could not forego the interest he felt for the advancement of the young men entering the profession. Mr. Armatage concluded with a few words of advice to the successful and unsuccessful candidates for the diploma of the Royal College of Veterinary Surgeons, and expressed a hope that all would endeavour to maintain the honour and integrity of the body which conferred this legal qualification, as well as strengthen its adaptability for the changes of successive generations.

The meeting then broke up.

OBITUARY.

WE have to record the death of Mr. John Anderson, of the Royal Artillery. Diploma dated December 21, 1859. Of Mr. Thomas Horne, of Barnsley, Yorkshire. Diploma dated May 2nd, 1860. Of Mr. William Vickers Waterhouse, of Connisbro', Rotherham. Diploma dated December 20, 1866. And of Mr. James Churchill, late of Watford. Diploma dated June 2nd, 1852.

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Communications and Cases.

THE MICROSCOPE IN VETERINARY MEDICINE.

By Professor Brown.

(*Continued from* vol. xl, p. 945.)

Examination of Morbid Deposits—Scrofula.

Among cattle in various parts of the country there exists an affection which is distinguished by well-marked morbid appearances, seriously affecting the integrity of certain structures, but which, nevertheless, does not appear to have been recognised in its full importance by veterinary pathologists.

The term "grapes," as applied to a peculiar form of deposit on the internal organs of cattle, is familiar to veterinarians, especially those who are practising in agricultural districts, and also to butchers and others, who are employed in slaughtering cattle, or examining carcases. It is not possible with the present limited information upon the subject, to decide what localities furnish the conditions under which the disease is developed. In Cheshire it prevails in many parts of the county, and specimens of the affection have been examined from other counties. The disease also exists on the Continent, as evidenced by the presence of the deposit in foreign cattle which are slaughtered in this country. From the results of *post-mortem* examinations it is probable that the deposition of scrofulous matter is of slow progress, and it is also evident that it may advance to a certain extent without

interfering with the life or health of the animal; commonly, for example, it will be observed in dressing a bullock, the condition of which is good, that there are numerous small circumscribed deposits, varying in size from that of a millet-seed to a walnut, between the layers of the mesentery or the peritoneum which is attached to the diaphragm, or surrounds the larger blood-vessels. In the cavity of the chest the deposit is frequently abundant, hanging in grape-like clusters from the free borders of the lung, being placed between the folds of the pleural membrane, on the surface of the pericardium, and at various points on the pleural covering of the ribs. Frequently a long string of these small tumours may be seen running along each side of the chest, attached to them by means of the pleura; and the process of trimming away the clustering grapes from the walls of the chest and abdomen forms part of the business of dressing the carcase. When searching in slaughterhouses for the traces of grapy deposits, the inquirer arriving too late to discover that which he seeks, will, nevertheless, observe in the chest and abdomen proof of the existence of the disease among certain of the animals, in the marks of the knife which has been employed to trim the tumours away. As in other affections, the progress of the disease varies much in different individuals. Instances occasionally occur, and very likely are of more frequent occurrence than is suspected, in which decided symptoms of disease are present, and a fatal termination results. In such cases the *post-mortem* investigation reveals an extraordinary condition of the lungs and tissues in the thorax especially. Large masses of the morbid product will be found on the surface of the organs, and the entire lung-tissue is often pervaded to such an extent as to cause the occlusion of the greater part of the respiratory tubes. As an example of this advanced form of the disease, a recent case, which was seen during life, may be alluded to.

A bull, which was purchased at the end of last year, was observed by the attendant, soon after his arrival at his new quarters, to be dull and dispirited. In a few weeks he became ill, and professional advice was obtained. On examining the animal it was found to be in bad condition; the coat was harsh and unthrifty; the breathing was quick, and carried on with grunting at times. There was also cough present. The pulse was quick and small. Throughout, the appetite was tolerably good. From the symptoms, it was concluded that the beast was suffering from chronic disease of the lungs; and the diagnosis was confirmed by percussion, which gave the peculiar dull sound indicative of consolidation, over

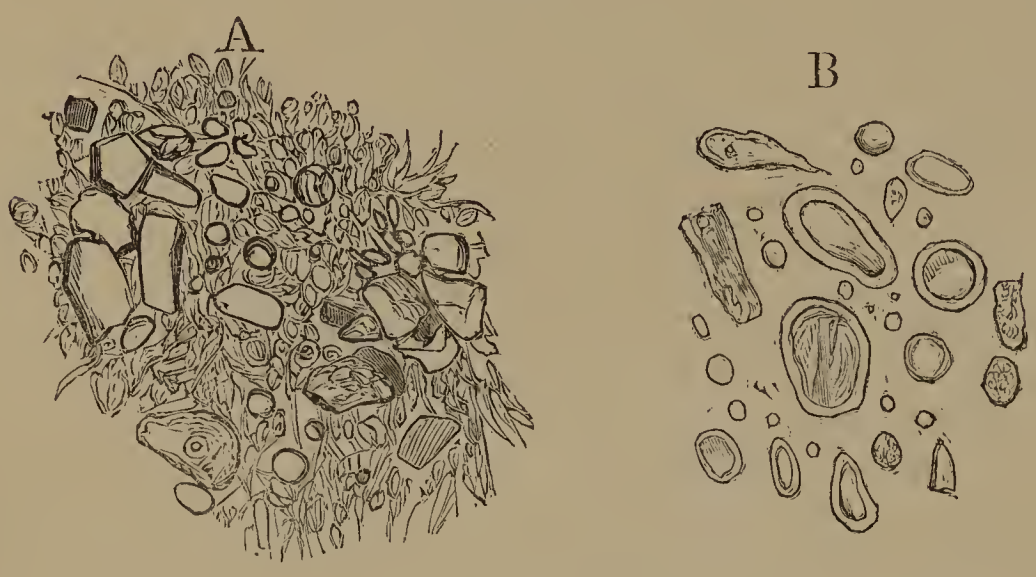
a considerable part of the thorax. No suspicion was entertained at the time of the exact nature of the deposit. Stimulant and tonic treatment was carried out by the exhibition at different times of ammoniacal compounds—gentian and iodide of iron; but the animal continued to grow worse, becoming gradually weaker and more emaciated; and about six weeks from the first observation of the illness he was destroyed. A *post-mortem* examination was made, and the morbid appearances definitely indicated that the animal was the subject of the disease known as "grapes." The deposit was of that extensive character which has been described, affecting the surface of the organs and structures in the thorax, and permeating the whole of the lung-tissue.

In every specimen that has been examined the histological elements, without being absolutely identical, have been always closely allied. Recent deposits, affecting the pleura or peritoneum, have been found to consist principally of masses of fat deposited in a fibrous stroma: but in the majority of instances the tumours, even the smallest of them, are seen to be constituted of a central mass of calcareous matter covered with a quantity of fibrous tissue; the relative proportion and the precise condition of the two components depend upon the development of the disease. In the early stage the tumours will mainly consist of the fibrinous element with fat, and a small quantity of calcareous deposit in the centre; the older and larger masses will frequently have a considerable portion of the internal part softened, the soft material varying in consistence from the cheesy condition to that of a creamy fluid. The calcareous deposit in such cases is not concentrated in the centre, but mingled with the softened mass.

For the purpose of investigating the arrangement of the elements of the deposits it is necessary to select, first, a small mass from a portion of the pleura; make a section through the centre; a thin slice may then be removed, either by means of the double knife or a razor. This section will be found to have one or more yellow points on its surface, formed by the calcareous material. The specimen having been placed on a glass slide in a drop of water, should be flattened by pressure under the compressorium, or between two pieces of glass, pressed together with the fingers until it become sufficiently transparent to be examined by a moderate power; one piece of glass should then be removed, the specimen spread out quite flat, washed by a stream of water, and covered with thin glass. If a quantity of white opaque debris still remain, a drop of liquor sodæ will dissipate it. Under an inch object-glass the specimen will now be found

to consist of a vaguely defined fibrous mass, with masses of calcareous matter collected at one of two points, or dispersed through the structure. The calcareous particles are easily recognised in comparison with the rest of the structure, by their highly refractive power and their sharp outline. A more conclusive test, however, is the addition of a drop of dilute hydrochloric acid, which immediately causes their solution with effervescence. The illustration A, fig. 8,

FIG. 8.



A. Section of a small rounded body from the pleura of a cow affected with scrofula, showing the fibro-granular matrix, with calcareous particles in the centre. Magnified 200 diameters.

B. A fragment of the same body, magnified 1300 diameters, showing small corpuscles similar to those found in tubercle.

indicates the appearance presented by a carefully prepared section of a single minute scrofulous deposit from the pleura, magnified 200 diameters. Several calcareous particles, with distinct outlines, are to be seen occupying the centre of the mass, imbedded in what appears to be a stroma of fibro-granular material, the aspect being much like that of recently deposited fibrin; a considerable number of fat-granules also exist.

The real nature of this granular mass can now only be determined by the use of a high power. A portion removed from the same specimen as that figured at A, was carefully teazed out; and after being covered with a piece of the thinnest glass, was examined by means of a one twenty-fifth objective. Under this power the appearances shown were those which are represented at B, fig. 8; the particles collected together to form the stroma of the mass are chiefly small oval bodies, resembling very closely the elements of the tuberculous deposit, and probably identical with them in cha-

racter. Minute portions of calcareous matter are also to be observed in the object, and likewise fat-granules.

One of the larger masses, of the size of a walnut, either in the lungs or in a mesenteric gland, where the deposit often occurs, will generally be found on section to have a peculiar marbled appearance, in consequence of the white tissue which forms the bulk of the tumour being variegated by the deposit of yellow calcareous matter. In some parts of the mass, generally near its centre, there will be found a collection of yellow fluid, exactly resembling pus in physical appearance. A small portion of this should be examined under a quarter-inch objective, which will prove it to contain none of the elements of pus. A few small exudation corpuscles are present; but the fluid is principally constituted of minute particles of an oblong shape, which under the highest powers resolve themselves into the tubercle corpuscles figured at B in the illustration.

A very interesting case of the disease has just been sent for examination by Mr. S. J. Rayment, the inspector of the Metropolitan Cattle Market. The animal had been slaughtered in the morning, and the morbid parts were examined shortly after their removal. Large masses of the deposit were found in the mesenteric glands, and the lung-tissue was completely infiltrated; but the pleural surface, both of the lungs and thorax, was remarkably free, only a few clusters of the grape-like bodies being found on the walls of the thorax; the surface of the lungs gave so little evidence of the amount of internal deposit, that the nature of the disease was not ascertained until the parts had been cut into. One very interesting feature in this case was the occurrence of softening in the centre of some of the tumours to an unusual extent. The fluid matter had the appearance of pus, and the condition altogether was precisely that commonly expressed in the terms the "tumour had suppurated." An examination of the matter under a quarter-inch objective proved, as was anticipated, that there were no pus-corpuscles; the fluid being entirely composed of the debris of calcareous matter, with a few exudation corpuscles, and the bodies represented at B in the illustration.

From the circumstances under which the deposit occurs, and from its histological characters, it can only be concluded that it belongs to those imperfectly organized accumulations which occur in scrofula and tuberculosis. Recent experiments tend to prove that these deposits can be produced locally by artificial means, such as the introduction of a seton or inoculation with some morbid product; in fact, by the use of means which derange the nutritive functions in a part.

It is, therefore, not illogical to assume that similar consequences, to a much greater extent, will follow the action of influences which occasion general derangement of nutrition; and that such causes are in constant operation in many parts of the country there can be no question. In veterinary pathology the disease, although in some degree recognised has held a very unimportant place; but in reality it deserves the serious consideration of the profession. There is something profoundly significant in the idea that certain local influences—such, for instance, as innutritious herbage, defective drainage, over-stocking, excessive use of manures, long continued action of setons, or other depletives, will produce a condition of the animal system allied to, if not positively identical with, the tuberculous diathesis; and there is even more serious import to be attached to the well grounded suspicion, that this condition, when induced, is capable of being hereditarily transmitted.

(*To be continued.*)

AN UNUSUAL CASE OF PERICARDITIS.

By Henry Lepper, M.R.C.V.S., Aylesbury.

The specimen of diseased heart which I send for your inspection is, I think, a very remarkable one. The disease, as you will see, is chiefly confined to the pericardium. It was associated with effusion to a great extent into the pleural cavity, there being not less than five to six gallons of serous fluid present. The history of the case, so far as I have been made acquainted with it, is, however, exceedingly simple.

On the 7th of the present month (April) I was requested by Mr. Elliott, of Aston Abbotts, to attend a mare of his, which was described as being very ill. I found my patient to be a young maae rising five years old, of the light-cart breed, and in very fair condition as to flesh. She would partake sparingly of food, but had a peculiar character of expression. Her pulse was 90 in the minute, and the respiration about 25. She was heavy in foal.

I was informed that on the first of the month, while doing ordinary farm-work with the other horses of the team, she perspired profusely and appeared to be very much distressed. This, however, was not taken much notice of at the time, as the labour was somewhat heavy; besides her pregnancy was

thought sufficient to account for the fatigue she experienced. Her owner had her put out of the team and turned into the yard for rest, and after a few days she was placed on a piece of fresh pasture.

The treatment I adopted consisted chiefly of sedative and diuretic agents combined, given twice a day. A stimulating embrocation was also applied to the sternum, which produced an unusual amount of tumefaction. The swelling continued to increase, and ultimately extended over the whole of the lower surface of the abdomen. Day by day she continued to get worse, until death put an end to her sufferings on the thirteenth day from the time I first saw her. On making a post-mortem examination, a very large quantity of serous effusion, not less than five or six gallons, was found in the pleural cavity, and between the layers of the mediastinum. At first it appeared as if the fluid was in the pericardial sac, but a closer examination showed that such was not the case.

Effusion had also taken place into the other cavities of the body, but not to a great extent. An extensive deposit of lymph, remarkable for its firmness, was also present on the external surface of the pericardium.

[An examination of the specimen showed that the substance of the heart was free from disease, and that its external surface was adherent throughout to the inner part of the pericardium, so as to closely unite the two organs together. The external surface of the pericardium was also loaded with recent lymph deposits, which hung from it in the form of hands or ropes three or four inches long, and almost as large as the little finger. The exudation was of a yellow colour, and had a roughened or granulated aspect. The pressure which this deposit had exerted upon the sac, together with that caused by the serous exudation, seemed to have given origin to secondary effusions within the pericardium by which it became united to the heart. We suspect that primarily the serous membrane of the chest was affected, and, if so, it is not a little remarkable that so much mischief should have resulted from one rather severe day's work. Pregnancy no doubt acted as a predisposing cause; and although it is often the case that cart mares are kept at work up to the day of their foaling, it is nevertheless important that their work should be light and easy. The effusion which was met with in the other cavities of the body no doubt was simply due to obstructed circulation, particularly through the large venous trunks.]

NOTES ON THE INFLUENCE OF ATMOSPHERIC PRESSURE AND ALTITUDE ON HEALTH AND DISEASE IN MAN AND THE LOWER ANIMALS.

By G. Fleming, F.R.G.S., &c., Royal Engineers.

(*Continued from p.* 291.)

The student of veterinary or medical science, in his researches into the effects of altitude on the lower animals or on the human species, cannot proceed very far in this investigation without going beyond Europe, in which mountainous ranges of great height are comparatively few. Indeed, the most striking and conclusive examples necessary for the illustration of our subject are only to be gathered from the observations of travellers who have visited the elevated regions of the other divisions of the globe; and to these we turn for information on this interesting and oftentimes important topic. We do this the more readily, because veterinary science is daily acquiring a wider and a weightier responsibility in dealing with everything relating to the multiplication and conservation of those creatures which are so essential to man in every part of the world; because many of our veterinary surgeons, especially those in the army, have to test their acquirements in every part of our almost limitless empire; and also because veterinary medical geography or topography has been hitherto almost, if not entirely, neglected by us.

For Africa our array of facts is meagre. I have already, in the *Veterinarian* for March, 1868, p. 184, given an example of the influence of altitude in procuring exemption from that most fatal malady among solipeds—the "horse-sickness of South Africa—and the probability of its being the same disease as that which proved so destructive to the horses and mules on our first landing on the shore of the Red Sea to invade Abyssinia. I also ventured to predict that the scourge would disappear in the highlands of that country, and ventured to suggest that bovine animals, who are not affected by it, should only be used in the lower altitudes. This opinion appears to have been amply verified by later intelligence; for instance, the correspondent of the *Pall Mall Gazette,* writing from Senafe on January 16th, says, "the mortality among the cavalry horses and the animals of the transport train is almost daily diminishing. Indeed, the epidemic now rarely smites animals which have not

been kept a considerable time in the lowlands; and those which perish have generally brought the seeds of the disease with them."

It is to be hoped that some of our veterinary surgeons who accompanied the expedition will fully report on this and like matters of interest. The wide range of the malady, and its clinging to low-lying regions, are particularly worthy of attention.

Burton,* of all the African travellers to whose writings I have been able to refer, is the only one who speaks on this subject. When crossing the higher altitudes of East Africa, he asserts that the caravans suffer very much from pneumonia and pleuritis.

From Asia we have many important facts derived from the testimony of travellers in the mighty mountain chain of the Himalayas.

Mr. Moorcroft†—that distinguished member of our profession, and whose untimely and melancholy death we must all deplore—in traversing the highest passes of these mountains, frequently speaks of the effects of the rarified atmosphere on himself and attendants. These were especially noticed in the Chang-la Pass, and were chiefly pains in the head and chest.

At the source of the river Oxus, 15,600 feet above the sea, and in winter, Lieutenant Wood writes:‡—"We were fully two hours in forcing our way through a field of snow not 500 yards in extent. Each individual of the party by turns took the lead, and forced his horse to struggle onward until exhaustion brought it down in the snow, where it was allowed to lie and recruit whilst the next was urged forward. It was so great a relief when we again got upon the river, that in the elasticity of my spirits I pushed my pony to a trot. This a Wakhani perceiving, seized hold of the bridle, and cautioned me against the *wind of the mountain*. We had, indeed, felt the effects of a highly rarified atmosphere ever since leaving Wakhan; but, the ascent being gradual, they were less than what would be experienced in climbing an abrupt mountain of much less altitude . . . . . Having cleared the snow from a portion of the surface of the lake, we commenced breaking the ice to ascertain its depth. This was a matter of greater difficulty than it at first sight appeared, for the water was frozen to the depth of two feet and a half, and, owing to the great rarity of the atmosphere, a few strokes of the pickaxe

* 'Lake Regions of Central Africa,' vol. ii, p. 318.
† 'Travels in the Himalayan Provinces.'
‡ 'Journey to the Source of the Oxus.'

produced an exhaustion that stretched us upon the snow to recruit our breath . . . . . A musket, loaded with blank cartridge, sounded as if the charge had been poured into the barrel, and neither wads nor ramrod used. When ball was introduced the report was louder, but possessed none of the sharpness that marks a similar charge in denser atmospheres. The ball, however, could be distinctly heard whizzing through the air. The human voice was sensibly affected, and conversation, especially if in a loud tone, could not be kept up without exhaustion; the slightest muscular exertion was attended with a similar result. Half a dozen strokes with an axe brought the workmen to the ground; and though a few minutes' respité suffice to restore the breath, anything like continued exertion was impossible. A run of fifty yards at full speed made the runner gasp for breath. Indeed, this exercise produced a pain in the lungs and a general prostration of strength, which was not got rid of for many hours. Some of the party complained of dizziness and headaches; but, except the effects above described, I neither felt myself, nor perceived in others, any of those painful results of great elevation which travellers have suffered in ascending Mount Blanc. This might have been anticipated, for where the transition from a dense to a highly rarified atmosphere is so sudden, as in the case of ascending that mountain, the circulation cannot be expected to accommodate itself at once to the difference of pressure, and violence must accrue to some of the more sensitive organs of the body. The ascent to Pamir was, on the contrary, so gradual that some extrinsic circumstances were necessary to remind us of the altitude we had attained. The effect of great elevation upon the general system had, indeed, been proved to me some time before, in a manner for which I was not prepared. One evening in Badakshan, while sitting in a brown study over the fire, I chanced to touch my pulse, and the galloping rate at which it was throbbing roused my attention. I at once took it for granted that I was in a raging fever; and after perusing some hints on the preservation of health which Dr. Lord, at parting, had kindly drawn out for me, I forthwith prescribed for myself most liberally. Next morning my pulse was as brisk as ever, but still my feelings denoted health. I now thought of examining the wrists of all our party, and to my surprise found that the pulses of my companions beat yet faster than my own. The cause of this increased circulation immediately occurred to me; and when we afterwards commenced marching towards Wakhan, I felt the pulses of the party whenever I registered the boiling point of water. The

motion of the blood is, in fact, a sort of living barometer by which a man acquainted with his own habit of body can, in great altitudes, roughly calculate his height above the sea. Upon Pamir the pulsations in one minute were as follows:

	Throbs.	Country.	Habit of body.
My own	110	Scotland . .	Spare.
Gholam Hussein, munstri .	124	Jasulmeree .	Fat.
Omerallah, mule-driver .	112	Afghan . .	Spare.
Gaffer, groom	114	Peshawaree .	Spare.
Dowd, do.	124	Kabuli . . .	Stout.*

This traveller's observations, as to the habits of the yak, are also interesting, as illustrative of the influence of altitude on that creature:

"The yak is to the inhabitants of Thibet and Pamir what the reindeer is to the Laplander in northern Europe. Where a man can walk a kash-gow may be ridden. Like the elephant, he possesses a wonderful knowledge of what will bear his weight. If travellers are at fault, one of these animals is driven before them; and it is said that he avoids the hidden depths and chasms with admirable sagacity. His footing is sure. Should a fall of snow close a mountain pass to man and horse, a score of yaks driven ahead answer the purpose of pioneers, and make, as my informant expresses it, a *king's highway*. In this case, however, the snow must have recently fallen; for when once its surface is frozen, and its depth considerable, no animal can force its way through it. Other cattle require the provident care of man to subsist them through the winter. The most hardy sheep would fare but badly without its human protection, but the kash-gow is left entirely to itself. He frequents the mountain slopes and their level summits. Wherever the mercury does not rise above zero is a climate for the yak. If the snow on the elevated flats lie too deep for him to crop the herbage, he rolls himself down the slopes and eats his way up again. When arrived at the top, he performs a second summerset, and completes his meal as he displaces another groove of snow in his second ascent. The heat of summer sends the animal to what is termed the old ice, that is, to the regions of eternal snow, the calf being retained below as a pledge for the mother's returning, in which she never fails. In the summer, the women, like the pastoral inhabitants of the Alps, encamp in the higher valleys, which are interspersed among the snowy mountains, and devote their whole time to the dairy. The men remain on the plain, and attend to the agricultural part of the establishments, but occasionally visit the upper

* Page 360.

stations; and all speak in rapture of these summer wanderings. The kash-gows are gregarious, and set the wolves, which here abound, at defiance. Their hair is clipped once a year, in the spring. The tail is the well-known chowry of Hindustan; but in this country its strong, wiry, and pliant hair is made into ropes, which for strength do not yield to those manufactured from hemp. The milk of the yak is richer than that of the common cow, though the quantity it yields be less. The Khirgis never extract the butter. The first yaks we saw were grazing among the snow on the very summit of the rugged pass of Ish Kashm; and at the village of this name I procured one for Dr. Lord, and despatched it to Kunduz in charge of two trusty men. But so cold a climate do these singular animals require, that though winter still reigned in the Kunduz plain, the heat was too great, and the yak died within a march or two of the town. In fact, it began to droop as soon as it passed Jerm. Some years back an Afghan nobleman succeeded in bringing two or three of these animals to Cabul; but even the temperature of that city, though situated 6000 feet above the sea-level, is not sufficiently cold to suit their constitution. They declined as the snow left the ground, and died early in the spring."*

Lieutenant Wood informs us that "neither goats nor the common cow are domesticated by the Kirghis, the continued cold of winter being too severe for them to thrive."

These elevated regions appear to be but little conducive to the breeding of animals. Food has, nevertheless, much to do with fecundity, there as elsewhere.

At the source of the Oxus, 16,500 feet above the sea level and near the line of perpetual snow (17,000 feet), Wood says:—"The grass of Pamir, they (the Kirghis) tell you, is so rich (in summer) that a sorry horse is here brought into good condition in less than twenty days, and its nourishing qualities are evidenced in the productiveness of their ewes, which almost invariably bring forth two lambs at a birth. Their flock and herds roam over an unlimited extent of swelling grassy hills of the sweetest and richest pasture, while their yaks luxuriate amid the snow at no great distance above this encampment on the plains."†

It is curious to find that the human natives of these highlands suffer in an equal degree with the yak when carried to low levels. Wood thus refers to this circumstance: "The Uzbeks who follow agricultural pursuits pitch their kirgahs in localities which most people would avoid. Though the

* Page 321. † Page 365.

green-sodded hills around invite them to encamp where the air is pure and the breeze healthy, they prefer the swamp and its miasma, and will not purchase health at the price of a certain degree of extra labour. It is, no doubt, convenient to them to reside in the midst of their cultivated fields; but the very circumstances which cause the extreme fertility of those fields render them deadly to man; to those, at least, who have not been gradually seasoned to the region; nor can any advantages which the husbandman obtains by residing on the low grounds be worth the risk which he incurs. Since the year 1830, Badakshan and the countries subject to, or, rather, 'chuppowed' by Murad Beg, on the northern brink of the Oxus, have been depopulated to stock the plains of Kunduz and Hazrat Imam. The aggregate of foreigners thus forcibly planted in these unhealthy marshes from that year to the present time is estimated by the Uzbeks at 25,000 families, or, in round numbers, 100,000 souls; and I question whether of these 6,000 were alive in 1838; so great had been the mortality in the short space of eight years. Truly may it be said *Azur moorda mekhie—Koondooz burrow*: 'If you wish to die, go to Kunduz.' Twelve months antecedent to our visit, a great portion of the inhabitants of Kulab were brought from their own hilly country down to Hazrat Imam. Dr. Lord and myself walked over the ground which their straw kirgahs had covered, and where some still stood; but silence and the numerous graves around tell us the fate of their former inmates."*

We will now refer to some observations made by Hooker,† during his botanical explorations in the Himalayas. In ascending the mountains in Nepal, he for the first time experienced unusual sensations. "On reaching 13,000 feet, the ground was everywhere hard and frozen, and I experienced the first symptoms of lassitude, headache, and giddiness; which, however, were but slight, and only came on with severe exertion."‡ In the Wallanchoon Pass, East Nepal, these sensations were more marked: "Towards the summit of the pass (16,764 feet) the snow lay very deep, and we followed the course of a small stream which cut through it, the walls of snow being breast high on each side; the path was still frequented by yaks, of which we overtook a small party going to Thibet, laden with planks. All the party appeared alike overcome by lassitude, shortness and difficulty of breathing, a sense of weight on the stomach, giddiness and headache, with tightness across the temples."§

* Page 392.
† Himalayan Journals.
‡ Vol. i, p. 221.
§ Page 224.

At 13,500 feet he rested, and remarks: "Except an excruciating headache, I felt no ill effects from my ascent."* The eyes of the Thibetan travellers whom he here met were much inflamed and bloodshot. In the Kambachan Pass of the same range he further remarks: "Being sanguine about obtaining a good view, I felt it almost impossible to keep my temper under the aggravations of pain in the forehead, lassitude, oppression of breathing, a dense drizzling fog, a keen cold wind, a slippery footing, where I was stumbling at every few steps, and icy-cold wet feet, hands, and eyelids."† In the Kongra hama Pass, he writes: "After two hours I was very stiff and cold, and suffering from headache and giddiness, owing to the elevation."‡ In the Sebolah Pass, at 17,585 feet, it is noted: "I tried the pulses of eight persons after two hours' rest; they varied from 80 to 112, my own being 104. As usual at these heights, all the party were suffering from giddiness and headaches."§ "It is somewhat remarkable that Turner nowhere alludes to difficulty of breathing, and in one place only to headache, when at these great elevations. This is in a great measure accounted for by his having been constantly mounted. I never suffered either in my breathing, head, or stomach, when riding, even when at 18,300 feet."‖ In the Donkia Pass, "the coolies of Dr. Campbell's party were completely knocked up by the rarified air; they had taken a whole day to march here from Yeumtso, scarcely six miles, and could eat no food at night. A Lama of our party offered up prayers to Kinchinjhow for the recovery of a stout Lepcha lad (called Nurko), who showed no signs of animation, and had all the symptoms of serous apoplexy."¶ At Yeumtso, Hooker himself suffered from fatigue and headache. "We pitched our little tent in the corner of the cattle-pen, and our coolies soon afterwards came up; mine were in capital health, though suffering from headaches, but Campbell's were in a distressing state of illness and fatigue, with swollen faces and rapid pulses, and some were insensible from symptoms like pressure on the brain; these were chiefly Ghoorkas (Nepalese)."** He afterwards, in referring to this question, admits that within a certain limit a great height may be reached, and that suddenly, without much inconvenience. However, "on ascending to 14,000 feet, owing to the diminished supply of oxygen, exercise brings on vertigo and headache; ascending higher still, lassitude and tension across the forehead ensue, with

* Page 226. † Page 252. ‡ Vol. ii, p. 82.
§ Page 142. ‖ Page 167. ¶ Page 177.
** Page 160.

retching, and a sense of weight dragging down the stomach, probably due to dilatation of the air contained in that organ. Such are the all but invariable effects of high elevations, varying with most persons according to the suddenness and steepness of the ascent, the amount and duration of exertion, and length of time previously passed at great heights. After having lived for some weeks at 15,300 feet, I have thence ascended several times to 18,500 feet, and once above 19,000 feet, without any sensation but lassitude and quickness of pulse; but in these instances it required great caution to avoid painful symptoms. Residing at 15,300 feet, however, my functions were wholly undisturbed; nor could I detect any quickness of pulse or of respiration when the body was at rest, below 17000 feet. At that elevation, after resting a party of eight men for an hour, the average of their and my pulses was above 100, both before and after eating; in one case it was 120, in none below 80."*

With regard to the influence of elevation on the lower animals, this naturalist gives us but few examples. We find it mentioned that in the Himalayas, in winter, the flocks graze below 8000 feet, on account of the great quantity of snow above that height; in summer they find pasturage as high as 17000 feet, consisting of grass and small tufted *carices*, on which they browse with avidity. Speaking of the yak, he says: "I never observed the yak to be annoyed by insects; indeed, at the elevation it inhabits, there are no large diphtera, bots, or gadflies to infest. It loves steep places, delighting to scramble among rocks, and to see its black hide perched on the glacial boulders which strew the Wallanchoon flat, and on which these beasts always sleep. . . . The yak, though indifferent to ice and snow, and to changes of temperature, cannot endure hunger so long as the sheep, nor pick its way so well upon stony ground. Neither can it bear damp heat, for which reason it will not live in summer below 7000 feet, where liver disease carries it off after a very few years."† The flesh of yak calves is excellent veal; we always returned the foot for the mother to lick while being milked, without which she yields nothing. The yak goes nine months with calf, and drops one every two years, bearing altogether ten or twelve. The common Sikkim cows of lower elevations, at Dorjiling, invariably goes from nine and a half to ten months, and calves annually; ponies go eleven months, and foal nearly every year. In Thibet the sheep are annually sheared; the ewes drop their young in spring and autumn, but the lambs born at the latter period often die of

* Page 413. † Vol. i, p. 214.

cold and starvation, and double lambing is unknown; whereas, in the plains of Bengal (where, however, sheep cannot be said to thrive without pulse fodder), twins are constantly born. At Dorjiling the sheep drop a lamb once in the season."*

With regard to the musk deer and other animals, it is noted: "The musk deer is only found in the highest and coldest part of the province, and the neighbouring countries of Thibet and Tartary. It cannot bear even the heat of Almorah. The same observation applies to the yak; it droops as soon as it leaves the neighbourhood of the ice. The shawl goat will live, but its wool soon degenerates, a very unfavorable presumption as to the event of the experiment of colonising them in Europe. On the other hand, the animals of the south seem to do very well among the snow. English dogs, impaired by the climate of the plains, improve in strength, size, and sagacity, among the Bhooteas; and, what is very remarkable, in a winter or two they acquire the same fine, short, shawl-wool mixed up with their own hair, which distinguishes the indigenous animals of the country. The same is, in a considerable degree, the case with horses; those which the Bhooteas bring down for sale are very beautiful, though rather shaggy little creatures, resembling extremely the Siberian ponies which I saw at Petersburg."† These solipedes appear to possess a more than ordinary flexibility of constitution, for Hooker elsewhere says: "The Thibetan pony, though born and bred 10,000 to 14,000 feet above the sea, is one of the most active and useful animals in the plains of Bengal, powerful and hardy; and when well trained early, docile, although by nature vicious and obstinate."‡

The following remarks from other sources apply to animals which are also denizens of high altitudes in Asia. The Gayal (*Gavæus frontalis*), a bovine found only to the eastward of the Brahmaputra river, is a hill animal, and does not thrive on the hot plains. "They lose their sight as they grow old, *and are subject to a disease of the hoof, which often proves fatal at an early age;* when the Kuki considers the disease beyond the hope of cure, he kills the gayal and eats its flesh."§ Mr. Elliot observes: "When kept at Kamerlah (Comilla), which is situate in a level country, some which I possessed used to resort to the tanks and eat on the steep sides of them; frequently betaking themselves to the water to avoid the heat of the sun. However, they became sickly

* Vol. ii, p. 151. † Vol. ii, p. 218. ‡ Vol. i, p. 118.
§ Macrae, 'Asiatic Researches,' vol. viii.

and emaciated, and their eyes suffered much, but on being sent to the hills they soon recovered, and are now in a healthy condition."*

The bison, or "gaour," of the Himalayas, will not domesticate, and has never been known to live beyond the third year, even in its native climate—the Sherwaroya hills. It suddenly dies from a disease marked by refusal of food, running from the nose, and an abominable stench from the mouth. Sir William Elliot says of this malady, "A similar disease, it may be noted, prevailed, as I was informed, among the gaour of the Sherwaroya, Shandamungalam, and Nilgiri hills.'†

Captain Webb, in exploring the Himalayas, and when at an altitude of between 15,000 and 16,000 feet, manifested the most embarrassing symptoms, particularly a tendency to apoplexy; and he mentions that horses and yaks are not exempt from such attacks.

Lieutenant Gerard ascended the same mountains on three occasions, to the heights of 15,600, 17,500, and 18,500 feet. On these expeditions he and those who accompanied him experienced extreme fatigue, great weakness, and violent headaches.

Captain Fraser, in climbing Djamnotri, one of the immense peaks of this chain, got as far as Bamsourah, when he experienced an insurmountable feeling of fatigue, symptoms of apoplexy, and nausea.

Victor Jacquemont, encamped at an absolute elevation of 2615 metres, in the valley of the Jumna, did not remark anything unusual; but, after two hours' journey above the snow line, he says that the difficulty of climbing on the soft snow was very great, and was increased by the rarity of the air, which rendered the respiration hurried and laboured, so that exhaustion took place about every thirty steps. In speaking of the messengers who brought his letters when at a height of about 4000 metres, he declares that when they were clambering up the rocks, they were compelled to rest every few yards. After some time, however, this traveller and his followers appear to have become accustomed to the atmosphere of these heights, for towards Thibet they often encamped at 4000 and 5000 metres, and have halted on, and passed beyond points 6,200 metres without any serious inconvenience.

For South America, a country offering the most diversified physical characteristics, we have an abundance of illustration,

* Macrae, 'Asiatic Researches,' vol. viii.
† 'Madras Journal of Literature and Science,' 1839.
‡ 'Correspondance pendant Son Voyage d'Inde,' vol. i, p. 275.

not only of the effects of climate on animal and vegetable existence, but also those of elevation.

Tschudi,* a modern celebrated German traveller and *savan*, appears to have been a particularly close observer of the influence of considerable altitudes in this region of the globe. When ascending the mighty Cordillera of Peru, he writes:—"After passing Cacray (about 12,000 feet of elevation), the diminished atmospheric pressure begins to produce an effect on coast horses, which have not been accustomed to travel in the Sierra. They are attacked with a malady called the *veta*, which shows itself by difficulty of breathing and trembling. The animals are frequently so overpowered that they are unable either to move or stand, and if they are not immediately unsaddled and allowed to rest they perish. The *arrieros* (conductors or mule-drivers) consider bleeding a cure for this malady. They sometimes slit the horse's nostrils, a remedy which is probably efficacious, as it enables the animal to inhale the air freely. Chopped garlic put into the nostrils is supposed to be a preventive of the veta. Mules are less liable to the malady, probably because they ascend the acclivities more slowly than horses. The disease does not attack the native horses of the Sierra, for which reason they are better than the coast horses for mountain travelling. Mules, however, are preferable to either."† At Cashapalca, in the Cordilleras (13,236 feet above the sea-level), he remarks, "Two plants which are called by the natives *mala zerba* and *garban zillos*, and are a deadly poison to mules and horses, grow here in abundance. The numerous skeletons of beasts of burthen seen along the road bear evidence of the fatal effects of those plants."‡ Speaking of the air at these heights, it is noted:—"A remarkable effect of Puma wind is its power of speedily drying animal bodies, and thereby preventing putridity. A dead mule is, in the course of a few days, converted into a mummy, not even the entrails presenting the least trace of decomposition."§

This exaggerated dryness of the atmosphere has, no doubt, much to do with the physiological effects observed, and which are usually attributed to the attenuated air.

In the Montana de Vitoc district of Peru the same writer refers to the llamas, and asserts that horses and mules become feeble, and in two years after their arrival are usually unfit for work. "Indeed, they suffer so much from the attacks of the blood-sucking bat and the gadfly (tabano), that, after being only a few weeks in the Montana de Vitoc, their

* 'Travels in Peru during the Years 1838—1842.' London, 1847.
† Page 276. ‡ Page 278. § Page 304.

strength is exhausted, and they are scarcely able to reach the Puna. The llamas, which the cholos bring from Tapo to Vitoc, are so enfeebled and overcome by the journey that, on the second day after their arrival, it is often found necessary to send them to a colder district."* The animals peculiar to these elevations are, as might be expected, more susceptible of the influences at work in the lowlands than those which for the first time visit the Cordilleras. Thus it is, that though the Indians who are employed for the purpose of attending to and driving the weight-bearing llamas, have the greatest affection for these creatures, yet, "notwithstanding all the care and attention bestowed on them, many llamas perish on every journey to the coast, as they are not able to bear the warm climate."†

At certain seasons the untoward effects of elevation in Peru would appear to be less marked, perhaps, than in others, and particularly with animals allowed to take their own exercise. So it happens that, during the rainy season in this country, the cattle are driven into the Altos, where 15,000 feet of elevation is not unusual to graze upon; and yet we hear of no great inconvenience being observed, though we must remember that the herds are accustomed to these periodical migrations.

Von Tschudi's other observations on the effects experienced by man and some of the lower creatures in the Peruvian mountains are extremely interesting and valuable, as they show that, besides the rarified atmosphere, some additional but unknown agencies are in operation to vary or enhance these physiological phenomena. He also notices the effects of reflected light:

"In the heights of the Cordilleras the effect of the diminished atmospheric pressure on the human frame shows itself in intolerable symptoms of weariness and an extreme difficulty of breathing. The natives call this malady the *puna* or the *soroche;* and the Spanish creoles give it the names of *mareo* or *veta.* Ignorant of its real causes, they ascribe it to the exhalations of metals, especially antimony, which is extensively used in the mining operations. The first symptoms of the *veta* are usually felt at the elevation of 12,600 feet above the sea. These symptoms are vertigo, dimness of sight and hearing, pains in the head and nausea. Blood flows from the eyes, nose, and lips. Fainting fits, spitting of blood, and other dangerous symptoms, usually attend severe attacks of veta. The sensations which accom-

* Page 457. † Page 309.

pany this malady somewhat resemble those of sea-sickness, and hence its Spanish name *mareo*. But sea-sickness is unaccompanied by the distressing difficulty of breathing experienced in the veta. This disorder sometimes proves fatal, and I once witnessed a case in which death was the result. Inhabitants of the coast and Europeans, who for the first time visit the lofty regions of the Cordillera, are usually attacked with this disorder. Persons in good health and of a spare habit speedily recover from it, but on plethoric and stout individuals its effects are frequently very severe. After an abode of some time in the mountainous regions, the constitution becomes inured to the rarefied atmosphere. I suffered only two attacks of the veta; but they were very severe. The first was on one of the level heights; and the second on the mountain of Antaichahua. The first time I ascended the Cordillera I did not experience the slightest illness, and I congratulated myself on having escaped the veta; but a year afterwards I had an attack of it, though only of a few hours' duration. The veta is felt with great severity in some districts of the Cordillera, whilst in others, where the altitude is greater, the disorder is scarcely perceptible. Thus it would seem that the malady is not caused by diminished atmospheric pressure, but is dependent on some unknown climatic circumstances. The districts in which the veta prevails with greatest intensity are, for the most part, rich in the production of metals, a circumstance which has given rise to the idea that it is caused by metallic exhalations.

"I have already described the effect of the Puna climate on beasts of burthen. Its influence on some of the domestic animals is no less severe than on the human race. To cats it is very fatal, and at the elevation of 13,000 feet above the sea these animals cannot live. Numerous trials have been made to rear them in the villages of the upper mountains, but without effect; for after a few days' abode in those regions, the animals die in frightful convulsions; but when in this state they do not attempt to bite. I had two good opportunities of observing the disease at Yauli. Cats attacked in this way are called by the natives *azorochados*, and antimony is alleged to be the cause of the distemper. Dogs are also liable to it, but it visits them less severely than cats, and with care they may be recovered.

"Another scourge of the traveller in the Cordillera is the disease called the *surumpe*. It is a violent inflammation of the eyes, caused by the sudden reflection of the bright rays of the sun on the snow. By the rarefied air and the cutting

wind, the eyes, being kept in a constant state of irritation, are thereby rendered very susceptible to the effects of the glaring light. In these regions the sky is often for a time completely overshadowed by snow clouds, and the greenish yellow of the plain is soon covered by a sheet of snow: then suddenly the sun's rays burst through the breaking clouds, and the eyes, unprepared for the dazzling glare, are almost blinded. A sharp burning pain is immediately felt, and it speedily increases to an intolerable degree. The eyes become violently inflamed, and the lids swell and bleed. The pain of the surumpe is the most intense that can be imagined, and frequently brings on delirium. The sensation resembles that which it may be imagined would be felt if cayenne pepper or gunpowder were rubbed into the eyes. Chronic inflammation, swelling of the eyelids, dimness of sight, and even total blindness, are the frequent consequences of the surumpe. In the Cordillera, Indians are often seen sitting by the roadside shrieking in agony, and unable to proceed on their way. They are more liable to the disease than the Creoles, who, when travelling in the mountains, protect their eyes by green spectacles and veils."*

Tschudi thus describes one of the attacks of *veta* he experienced when crossing the Cordillera of Peru:—"It was now two o'clock in the afternoon, and I had ridden on a continuous though gradual ascent since sunrise. My panting mule slackened his pace, and seemed unwilling to mount a rather steep ascent which we had now arrived at. To relieve him I dismounted and began walking at a rapid pace. But I soon felt the influence of the rarefied atmosphere, and I experienced an oppressive sensation which I had never known before. I stood still for a few moments to recover myself, and then tried to advance; but an indescribable oppression overcame me. My heart throbbed audibly; my breathing was short and interrupted. A world's weight seemed to lie upon my chest; my lips swelled and burst; the capillary vessels of my eyelids gave way, and blood flowed from them. In a few moments my senses began to leave me. I could neither see, hear, nor feel distinctly. A grey mist floated before my eyes; and I felt myself involved in that struggle between life and death which, a short time before, I fancied I could discern on the face of nature. Had all the riches of earth, or the glories of heaven awaited me a hundred feet higher, I could not have stretched out my hand towards them. . . . . After wandering about in various directions, I at length recovered

* Page 296.

the right path, which was marked by numerous skeletons protruding above the snow. These were the remains of beasts of burthen, which had perished on their journeys; a welcome, though an ominous guide to the wandering traveller. The clouds now suddenly separated, and the blazing light of the tropical sun glared dazzlingly on the white plain of snow. In a moment I felt my eyes stricken with *surumpe*. Suffering the most violent pain, and tormented by the apprehension of blindness, I with great difficulty pursued my way. . . . Exhausted by the fatigue of the day, I lay down to sleep; but no sooner had I fallen into a slumber than I was awoke by a violent smarting in my eyes, occasioned by the *surumpe*. There was no longer any hope of sleep. The night seemed endless. When the dawn of morning appeared, I made an effort to open my eyes, which were closed with coagulated blood. On looking around me I beheld all the horrors of my situation. A human corpse had served for my pillow. Shuddering I went in search of my mule, for I was eager to hurry from this dismal spot; but my misery was not yet at an end. The poor beast lay dead on the ground; in his ravenous hunger he had eaten of the poisonous *garbancillo*."*

Elsewhere Tschudi makes the singular remark, which has been already referred to, that on the Cordilleras of South America, at elevations of more than 12,000 feet, delicate breeds of dogs, and the European domestic cat, are exposed to a particular kind of mortal disease. "Innumerable attempts have been made to keep cats as domestic animals in the town of Cerro del Pasco (lying at an elevation of 14,100 feet above the level of the sea); but such endeavours have invariably been frustrated, as both cats and dogs have died in convulsions at the end of a few days. The cats, after being attacked by convulsive fits, attempt to climb the walls, but soon fall to the ground exhausted and motionless. I frequently observed instances in Yauli of this chorea-like disease; and it seems to arise from insufficient atmospheric pressure."†

The hairless dog (*Canis caraibicus*, Leeson) of Peru suffers very much when removed from the plains to the Cordilleras.

The great mountain plateau which surrounds the volcano of Antisana is 13,473 feet above the sea's level, and the pressure of the atmosphere is so inconsiderable at this height, that blood will flow from the nostrils and mouth of the wild bull when hunted with dogs.

In Colombia, Humboldt notices this fact in the following

* Page 358.

† Tschudi, 'Untersuchungen über die Fauna Peruana.'

remarks:—"In the month of March, 1802, we passed some days in the great plains around the Volcano of Antisana, a height of 2107 toises, where the wild cattle, when hunted, sometimes vomit blood. On the 16th of March, we discovered on a declivity a path in the snow, by which we ascended to the height of 2773 toises; the barometer fell to 14″ 7‴, and owing to the great rarity of the air blood flowed from our lips, gums, and even our eyes; we experienced very severe prostration, and one of our companions fell down in a swoon. During our journey to Chimborazo we ascended to within 250 toises from the summit and achieved a height of 3131 toises; the mercury fell to 13″ 11‴, the thermometer was 1·°3. We felt the same as on the summit of Antisana; even two or three days after our return to the plains, we were indisposed, and could only attribute this as a consequence of the air in these elevated regions."*

Elsewhere we find another notice of this region.† "On the 23rd of June, 1802, Humboldt undertook the ascent of Chimboraz. After a long stay on the plateau of Quito, he rested for a brief time on the plain of Tapia (2890 metres), with his companions, MM. Bonpland and Carlos Montufar; afterwards he passed a night on Calpi (3157 metres), and on the 23rd commenced to climb the lower slopes of the mountain, reaching as high as 3800 metres. At 4385 metres he encountered newly fallen snow, and gained 5574 metres, without himself or companions having suffered much inconvenience. When he had attained 5076 metres, however, all the Indians in his suite left him, with the exception of one, on the pretence that they suffered much more than he did. Starting from the 5574 metres, Humboldt says:—"After we had clambered upwards of an hour we gradually began to experience feelings of uneasiness. The desire to vomit was accompanied by vertigo, which was much more distressing than the difficulty in respiring. A half-bred Indian of San-Juan, a very robust individual, suffered more than we did. Our gums and lips bled, and the ocular conjunctiva in all, without exception, was gorged with blood. . . . . On Antisana, Don Carlos Montufar bled much from the gums.

"All these phenomena are very dissimilar, according to the age, the constitution, the fineness of the skin, and the previous strain on the muscular power; nevertheless, there is for each individual a kind of measure with regard to the rarefaction of the air and the altitude. According to my

* Humboldt, 'Ansichten der Natur.'

† Boudin, 'Traité de Géographie et des Statistique Médicales,' vol. i, p. 179.

observations, these phenomena manifested themselves in the white man when the barometer stood between $0^{m}{\cdot}379$ and $0^{m}\,428$. Our journey beyond the region of perpetual snow lasted for three hours and a half, during which, and notwithstanding the rarefaction of the air, we did not require to rest ourselves."* They reached an altitude of 18,096 feet.

Darwin, in ascending the Cordillera, says:—"About noon we began the tedious ascent of the Peuquenes, and then for the first time experienced some little difficulty in our respiration. The mules would halt every fifty yards, and then the poor willing animals after a few seconds started of their own accord again. The short breathing from the rarified atmosphere is called by the Chilenos 'puna;' and they have most ridiculous notions concerning its origin. Some say, 'all the waters here have puna;' others, that 'where there is snow there is puna;' and this no doubt is true. It is considered a kind of a disease, and I was shown the crosses over the graves of some who had died 'punado.' Excepting, perhaps, in the case of a person suffering from some organic disease of the heart or chest, I should think this would be an erroneous conclusion. A person near death would probably at this elevation experience a more unusual difficulty in breathing than others; and hence the effect might be assumed as the cause. The only sensation I felt was a slight tightness over the head and chest; a feeling which may be experienced by leaving a warm room, and running violently on a frosty day . . . . certainly the exertion of walking was extreme, and the respiration became deep and laborious. . . . . I am told that at Potosi (about 13,000 feet), strangers, do not become quite accustomed to the atmosphere for an entire year. The inhabitants all recommend onions for the 'puna;' and as this vegetable has sometimes been given in Europe for pectoral complaints, it may possibly be of real service."†

Mr. Markham noticed the effects of elevation on health during his journey across the Cordillera of the Andes to Puno, and between that place and Arequipa. "Both man and beast are subject to a most distressing illness, caused by the rarefaction of the air at these great altitudes, which is called *sorochi* by the Peruvians. I had suffered from a sharp attack of illness at Arequipa, so that I was probably predisposed to a visitation from *sorochi*, which I certainly endured to its fullest extent. Before arriving at Apo, a

* 'Mélanges de Géologie et de Physique Générale.' Paris, 1854. Vol. i, p. 150.

† Darwin, 'Voyages of Adventure and Beagle,' vol. iii.

violent pressure on the head, accompanied by acute pains and aches in the back of the neck, caused great discomfort, and these symptoms increased in intensity during the night at the Apo post-house; so that at three a.m., when we recommenced our journey, I was unable to mount my mule without assistance." "In the neighbourhood of Cuevillas there are large sheep-farms, one called Toroya, near the 'Alto de Toledo,' and another called Tincopalca, further on. The sheep, at this enormous height, lamb in March and July, and, of the March lambs, usually about fifty per cent. survive. . . . . The hills are covered with tufts of coarse grass (*stipa ychu*), of which the llamas eat the upper blades, while the sheep browse on the tender shoots underneath."*

Jourdanet,† while asserting that elevation lessens the respiratory endosmosis, says that cattle imported into the highlands of Mexico suffer very much from the change. Horses with difficulty run badly, are often sick, and suffer severely from rheumatism and pleurisy.

Another writer remarks: "In the *Sierra Fria* the air is rarified, and always a little damp; it is dangerous for those who are disposed to diseases of the chest; inflammatory and bilious fevers are not rare, neither are obstinate rheumatisms; in summer sun-stroke is frequent." And again he says of Mexico, or Zenochtitlan, a plateau 7400 feet above the level of the sea: "The plateau of the Cordilleras, to which belongs the valley of Zenochtitlan, is free from the contagious diseases of the coast. The sun has not at these elevations the same evil influence on the marshy ground which surrounds the town that it has in the *Sierra Caliente* (hot region), but the sulphuretted hydrogen gas exhaled from the lakes, and especially from Zezcuco, in great abundance, tends to infect the air and make it unhealthy."‡

Another observer§ notices the great contrasts of temperature in Peru, "where one is burned in the sun and frozen in the shade, *and where the rarefied air causes very dangerous and often fatal pneumonias.*" It is surprising that the respira-

* C. R. Markham, 'Travels in Peru and India,' 1862, pp. 89, 91.

† Jourdanet, 'Du Mexique au point de vue de Son Influence sur la vie de l'Homme.' Paris, 1861.

It is with regard to these observations that Dr. Parkes remarks in his work on 'Hygiene,' "The statements of M. Jourdanet are so adverse to general opinion, that it is to be hoped the subject will be soon thoroughly investigated." Our inquiries will amply testify to the correctness of these statements, the effects of the diminution of the respiratory endosmosis and other *sequelæ* of an abnormal kind having for a long time been made public.

‡ Mühlenpford, 'Mexico,' vol. i, p. 350; vol. ii, p. 263.

§ 'Mexicanische Zustände,' vol. i, p. 21.

tion should suffer when the barometer is extraordinarily high; on one occasion this writer feared an attack of apoplexy when it stood for some hours at the height of 23,330 inches.

Glennie, in his journey to Mount Popocateptl, began to experience the unpleasant sensations consequent upon breathing the attenuated air at an elevation of 16,895 feet; exhaustion, difficulty of breathing, headache, etc., were the chief symptoms.*

Burkhart, speaking of the high table-land of Mexico, mentions the disease of horses and mules, which is also present in Peru. He says: "The horses and mules in Mexico are often liable to a malady which is but little or altogether unknown in Europe. If they are well fed and forced to great exertion, or to quick and continued movements during the hot period of the day, they are readily seized with a palpitation of the heart and accelerated pulse and circulation, and to such a degree, that the whole body is thrown into strong convulsions. Large bloodlettings are the best measures to adopt against this disease, which is named 'Asoleado.' Other means are also often employed which serve to ameliorate the disease, but do not entirely cure it; so that it shows itself again during any great effort. If horses or mules are bought, it is necessary to gallop them for a short time, to discover if the malady does not betray its presence by a loud palpitation in the region of the chest. Animals often die when used for some time without resting."†

Lyell states, that some English mine owners on the Mexican plateau, at a height of 9000 feet, had imported some English hounds to hunt the hares, but they could not run in consequence of the rarefied atmosphere, and lay down gasping before they reached the game. Their offspring, however, were not so affected, and chased the hares as steadily and heartily as in England.‡

Bonelli, when crossing the Cordilleras, has the following notice: "The distress of the poor beasts of burden soon became very apparent. Every moment they were obliged to stop for want of breath, the great altitude we had attained rendering this more than ever necessary. When disposed to take a little temporary repose, no power on earth could have made them stir till they had in some degree recruited their strength. Even I myself occasionally lingered behind, in spite of a remonstrance from my guide. . . . The caution

* Glennie, 'Philosophical Magazine,' 1828, p. 449.
† Burkhart, 'Reisen in Mexico,' vol. i, p. 63.
‡ Elliotson, 'Physiology.'

he gave me was shown to be not without reason, for on gaining the summit I immediately became sensible of a very heavy oppression on the respiratory organs, and I experienced such a racking headache, that I speedily lost all consciousness." When at the city of La Paz, he continues: "One might naturally imagine, from the geographical bearings of this country, that excessive heat would prevail in many parts of it; but this is not the case. The land is so raised above the level of the sea—in many instances so much as 11,000, 12,000, or even 13,000 feet—that the air is exceedingly rarified, and the disease called the *soroche*, which consists in a difficulty of respiration when undertaking the least exertion, is extremely common, and much experienced by strangers, when exposed to the fatigue of ascending or descending the hilly streets of the capital."*

Bouguer,† in journeying to Quito, remarked similar phenomena: "We were much incommoded by the rarefaction of the air. Those amongst us who had feeble chests experienced still more the change, and they sometimes bled a little at the nose. This was no doubt owing to the diminished pressure of the atmosphere, which no longer retained the blood in its vessels. I did not myself observe that this difficulty became greater as we ascended; perhaps because I was already accustomed to the country, or because the cold prevented the expansion of the air. Several of our number fainted in ascending, and often vomited; but these accidents were due more to fatigue than to difficulty in breathing. This is put beyond doubt by the fact that those who rode on horseback were not subjected to these inconveniences, or after they had attained the summit. I do not deny that the rarity of the air augments the fatigue, for the respiration becomes very difficult when any effort is made, and the slightest movement puts one out of breath. This does not occur when one is inactive." When on the summit of Pichinga, he reports that the cold was so great that some of his companions showed symptoms of scurvy, and the Indians who were with him had severe abdominal pains. In crossing the Guanacas, he also informs us that this route has great terrors, and that the mules run more risk than the men, in consequence not only of the cold, but the fatigue and lassitude which overtakes them. All along the pass, for a distance of two leagues, the ground was covered with the bones of mules which had expired there, and so thick did they lie that every footstep was on them.

* Bonelli, 'Travels in Bolivia.' London, 1854, pp. 167, 210.

† Bouguer, 'Memoires de l'Academie,' 1774.

Ulloa,* a great authority on South America, although not a very recent one, in speaking of Upper Peru, says:—"The sun is generally called in these regions, where it exercises its effects most severely in the summer months, the Sun of Puna. Those who know these countries are aware that it is very intense, for when it acts freely it burns to an almost insupportable degree, and gives rise to headaches, and other accidents. We have many times observed that at mid-day, in an enclosed space the sun was so hot that at two paces in the shade, the cold appeared to be extreme. This is caused by the rarefaction of the air, which cannot retain the light, and there is no reflected heat; the earth does not become heated, and as soon as the sun sets it freezes, because the atmosphere does not possess those heating properties it has in countries where it is more dense." When speaking of the descent from the mountains, or "pumas," into the low valleys or "Quebradas" he makes the following relation:—"When we descend from Guancavelica to the quebrada of Iscuchaca, we are half way, and can easily perceive the expansive movements of the organism; though all parts of the body cannot expand with the same facility. There happens a kind of suffocation, which is recognised by a buzzing in the ears, sighing, a tingling and itching sensation in the extremities, and other similar symptoms. These changes occur within a space of eight leagues, for in as many hours we were able to proceed all right." He explains these phenomena by the expansion produced by the heat, but it may have been due to augmented atmospherical pressure. When in the Punas or mountains of Peru, he notes, "The effects of the cold and the rarity of the air are so marked as to be perceived at once on the living bodies as well as on metals. The atmosphere is dry and subtle, and causes such desiccation that the epidermis on tender parts, particularly on the lips, cracks, and they become painful and bleed; the hands become rough and scaly, and assume a dark colour, which cannot be removed by washing. The Indians term this accident 'chunno,' a word signifying to be made crisp or hardened by the cold. Similar effects can be observed in metals. Thus bells become cracked, and split rapidly in spite of every attempt to prevent them by making them thicker and stronger; an accident which does not occur in countries where it freezes much more than in ours, and is a proof that besides the cold there is also the subtlety of the air at work. The climate of the Punas is strongly anti-putrescent. Fish caught in the sea, if they

* Ulloa, 'Relacion Historica del Viage a la America Meridional.' Madrid, 1748, vol. i.

arrive some hours afterwards in the Punas, may be transported fifty and sixty leagues, and kept as long as may be wished, without decomposing. It rains much in this country during the winter, but notwithstanding this the air is always dry; the water courses down the walls and along the floors of the houses, but it does no harm to the health. If we ascend from the low regions to these heights, there is felt over the whole body an uneasy sensation, which is yet more disagreeable than cold; for none of the means we employ against cold will avail here—neither the heat of a fire, nor the softest and warmest bed. This uneasiness lasts for some days, and is more inconvenient during the night than the day; in spite of all the external means we may resort to heat ourselves, we feel cold in the interior of the body, as if in the cold stage of intermittent fever. This unpleasant sensation continues from twenty to thirty days; when it diminishes we are habituated to the climate. If the organism is once accustomed to the climate, the cold is no more felt than in those countries where the temperature of summer and winter differs by many degrees. Those people who are not acclimatised suffer also from a very severe and very disagreeable disease called the *Mareo de la Puna*, which rarely spares a new arrival, and is as annoying and afflicting as sea-sickness. The head is seized with giddiness, heat, and great pain; sickness and feebleness are followed by bilious vomiting; there is prostration of vital power, and loss of strength, and fever is developed. There are sometimes people who are so overpowered and feeble that their life appears to be in danger to those who do not understand the Mareo. The disease continues for two or three days; after this there is perfect recovery. Every one is not quite affected to this degree, though it is rare, indeed, that any escape. In the district of Quito, which is no less elevated than the other parts of Peru, this malady is not seen; for it differs from the disease which is there named Enparamarse; at any rate we have not witnessed it. It has been remarked that those persons who are very liable to sea-sickness are also as liable to this disease of the Punas, and *vice versâ*. Another accident is noticed amongst animals in these regions. If they ascend from the plains to the Punas, their respiration becomes very difficult; they halt often to breathe, and they frequently fall down and die on the spot. The inhabitants name this mishap *Pasar la veta* (to pass a metallic lode), because they suppose that there is at such a place a vein of some kind of metal, and that the earth there exhales particles of antimony, sulphur, arsenic, &c. . . . But it is rather the subtle air

which is the cause, for men who have not been some time in the country experience like phenomena to those mentioned as appearing in animals. In walking, for instance, they feel prostrated, and have a sense of constriction and suffocation which is very painful, and forces them to stop and rest. This accident even happens to them in the plain, and can be assigned to no other cause than the subtle air." As diseases of the chest are very prevalent, so is spitting of blood, which is observed in the coldest regions, very common at Guancavelica; but there are no hectic maladies; on the contrary, these are met with in the low-lying districts where spitting of blood is rare." When, in his scientific explorations, he was obliged to ascend the mountain Pichincha, he relates:—"The ascent from this stupendous rock, from the base, or the place where the mules could come, to our habitation, was so craggy as only to be climbed on foot, and to perform it cost us four hours' continual labour and pain, from the violent efforts of the body and the subtlety of the air; the latter being such as to render respiration difficult. It was my misfortune, when I climbed about half way up, to be so overcome that I fell down, and remained a long time without sense or motion, and, as I was told, with every appearance of death in my face."

In speaking of the "gamalote" of Baba, South America, he says, "When the gamalote is at its full growth, the height of water, during the floods, by rising above its top, presses it down, and rots it, so that when the waters ebb away, the earth seems covered with it; but at the first impression of the sun it shoots again, and, in a few days, abounds in the same plenty as before. *One thing remarkable in it is, that, though it proves so nourishing to the cattle of this district, it is very noxious to those from the Cordillera, as has been often experienced.*"

Acosta,* three centuries ago, made similar observations to those of Ulloa, with regard to the highlands of Peru, but particularly to the high mountain Pariacaca, whose ascent required much preparation. This venerable authority suffered serious inconvenience, though on horseback. Sensations of oppression and weakness seized him, accompanied by vomiting, at first of phlegm, then blood, increasing with great violence; with other symptoms of a like character, due to the sudden transition from the atmosphere of the lowlands to the diminished æther of the lofty summit. He also mentions that not only men, but *animals* suffered from this subtle and penetrating air entering their bodies.

(*To be continued.*)

* 'Historia Natural y Moral de las Indias,' etc. Seville, 1590.

ECZEMA EPIZOOTICA.

We learn from various parts of the country that the mouth and foot disease of cattle—eczema epizootica—is again becoming rife, and assuming a more severe form than it has usually done of late years. The disease is evidently very widely spread at this time. Numbers of Irish store cattle have been found to be affected either on their arrival here or immediately afterwards; and during the last few weeks, also, many imported cattle both from northern, central, and southern Europe have been brought in suffering from the disease. There is something remarkable in these periodic outbreaks of this and other infectious diseases, which calls for investigation on the part of the members of our profession. It behoves every one of us to examine each outbreak separately, more especially with a view of ascertaining whether it depended on the introduction of infected animals, or on the morbific matter of the disease having been brought into the place by other means. Diseases which assume an epizootic type are commonly regarded as being directly induced by some peculiar condition of the atmosphere, but it is to be borne in mind that to be so, the special germs of the affection must be commingled with the air. Certain states of the atmosphere may favour the production of disease by inducing a susceptibility to the attack, and it is to them as a secondary, rather than a primary, cause to which heed should be given. An accumulation of facts is of the first importance in all inquiries of this kind, and we shall feel greatly obliged by being kept informed of these outbreaks by our several readers. The interest now attaching to cattle epizootics and also enzootics may be said to be greater than ever, which is an additional reason why we hope to hear of these occurrences as they are observed from time to time in different parts of the country.

ANÆMIA IN SHEEP FROM ENTOZOA.

We have now under our care a large number of ewes, some of which are located in counties far distant from each other, and on soils which greatly differ in their physical conditions, that present appearances so allied to rot, as to have induced a belief in some of the instances that the animals were the subjects of this destructive malady. These cases are not new to us, and our readers will remember that from time

to time we have called attention to the great increase of entozoic diseases, more particularly among sheep and cattle. The habitat of the entozoa in question is the abomasum, where, in many instances, thousands of the worms are to be found attached to the mucous membrane of the stomach. They are enabled to retain their hold by being furnished with four minute barbs just behind their head, whose points are directed backwards, hence the name *Filaria hamata*. The worms anæmiate the animal by drawing their nutriment direct from the plasma of the blood. Salt is found to be one of the best agents for their destruction, and the drenching of the sheep with a few doses of a solution of salt will often effect a cure. In most instances, however, this must be followed up by tonics into which the compounds of iron largely enter. In all cases a corn or cake diet is indispensable.

Facts and Observations.

Preservation of Meat by means of Ether.—M. Martin has made some experiments upon the preservation of meat by means of ether. He placed in six tin boxes uncooked beef, surrounded by little tufts of cotton wool soaked in sulphuric ether; the boxes were then soldered tight, and exposed to the rays of the sun. Every three months a box was opened. Each piece of meat weighed a kilogramme. At the end of three months there was no alteration either in weight or form. The meat thus preserved does not undergo the putrid fermentation; it is strongly impregnated with ether, and the odour remains after numerous washings with cold water. When cooked the meat possesses a peculiar savour, probably due, M. Martin says, to the formation of a new ether: the fibre is disintegrated. The process is not applicable to the preservation of food, but other animal matters might perhaps be advantageously treated by it.

Absorption of Arsenic, Tungstic, and Arsenious Acids from Solution by Charcoal.—Mr. W. Skey says: "In a former number of the *Chemical News*, I stated that charcoal absorbed nitric acid from sulphuric acid; I have since found that it also absorbs the substances here specified under the following circumstances. If a few drops of a solution of salt of arsenic, or arsenious acid, is put into a few ounces of dilute sulphuric acid, and the mixed solution agitated at intervals with recently ignited charcoal for an hour

or two, the clear liquid obtained by filtration does not manifest any reaction of arsenic when tested by Marsh's process. Lignite has not the same effect as charcoal, though absorbent of weak acids and bases generally, as I have before shown. Tungstic acid also from acid solutions is removed by charcoal applied in like manner, and is given up to a solution of caustic alkali.

THERAPEUTIC USES OF PHOSPHORUS.—In the hands of M. Delpech, says M. Reveillout, phosphorus has given excellent results in the treatment of paralysis. Three patients, for example, recently in the wards of Lanté at one time, and presenting three types of paralysis, have been greatly benefited. One patient had been poisoned by the prolonged action of sulphide of carbon; another was the subject of paralysis *à frigore,* of the ascending form; a third had an apoplectic attack. In all, the effects of phosphorus were similar. Erections reappeared first; it is now perfectly demonstrated, indeed, that phosphorus is one of the most powerful aphrodisiacs. Subsequently, the locomotor and sensitive functions were restored without any accident occurring which could be attributed to the ingestion of the medicine. M. Delpech employs, reports the *British Medical Journal,* very small doses—one to two milligrammes (3-100ths to 6-100ths of a grain) of phosphorus daily; in one patient only he raised the dose to six milligrammes. The phosphorus is dissolved in oil, and this phosphorised oil is emulsified at the moment of administration in a solution of mucilage. Hireaud, Franck, and others, had already cured paralysis by the use of phosphorised oil. M. Delpech in Paris, and Dr. Radcliffe in this country, have brought it anew into notice.

EXTRACTION OF OILS BY BISULPHIDE CARBON.—At Moabit, near Berlin, the extraction of oils from seeds is now carried on upon a large scale. Hitherto colza and linseed have been chiefly operated upon. In the manufactory of M. Heyl, 2570 kilog. of oil sufficiently good for lubricating machinery are obtained daily. The seeds are first crushed, then dried by heat, and the residue is given to cattle, which has been by analysis found to contain less unexpressed oil than when ordinary pressure has been resorted to.

SCOTTISH METROPOLITAN VETERINARY MEDICAL SOCIETY.—The first meeting of this society was held at the Edinburgh College on the 13th ult., when an address was read by the President, Mr. Robertson, V.S., Kelso. The office bearers of this newly formed society are Mr. Robertson,

Kelso, President; Mr. Borthwick, Kirkleston; Mr. Waugh, Stirling, and Mr. Aitkin, Dalkeith, Vice-Presidents; Mr. Braid, Edinburgh, Treasurer; and Mr. Tod, Leith, Secretary.

Metropolitan Horse Show.—This show, which will be open to the public on June 1st and three following days, promises to be superior to any which have preceded it. The entries are large, and they represent some of the best blood in the kingdom. In addition to the sum of £365 given in prizes to hunters in four classes, the directors have offered a gold medal worth 25 guineas for the best hunter in the show. The judging of the animals will commence on Saturday, May 30th.

The Foreign Cattle Market Bill.—The committee having heard a variety of evidence for and against Dagenham Dock as a site for the new market, has decided that "The site of the market-place and yards shall be such lands situate within the metropolis, or on or near the banks of the Thames, not further east than Barking Creek." A number of other clauses have been amended and passed; while on clause 12, the Corporation having proposed an amendment, which was negatived, Mr. Hope Scott stated that after the decision come to by the committee the corporation withdrew from any further participation in the proceedings of the committee upon the bill, which has still been terribly knocked about by Mr. Vernon Harcourt as counsel for the trade, and Mr. Milner Gibson as the great opponent of the proposal.

Prizes for Shoeing Horses.—The following has been submitted by Sir George Jenkinson for the consideration of the Council of the Royal Agricultural Society of England: "That the council will at any future show after the present year offer a few prizes for village farriers or blacksmiths to compete for, in making, fitting, and nailing on shoes on horses, both for hunters and for those used for agricultural purposes, certain conditions to be specified and an inspection to be made of the work done by a properly qualified veterinary surgeon, by whom the principles to be followed and the faults to be avoided shall be pointed out to the various competitors, and the prizes for this class shall be awarded by a committee of say three gentlemen specially appointed for that purpose, assisted perhaps by the veterinary gentleman above mentioned. This has been tried in Gloucestershire, and with very good benefit, which fact will I am sure be corroborated by Col. Kingscote, C.B., M.P., a member of the council.

THE VETERINARIAN, JUNE 1, 1868.

Ne quid falsi dicere audeat, ne quid veri non audeat.—CICERO.

ANNUAL MEETING OF THE MEMBERS OF THE VETERINARY PROFESSION.

ANOTHER general gathering of veterinary surgeons has been held, and, according to annual custom, the report of the proceedings of Council during the past year has been submitted and criticised. As the members who represented the body corporate dealt gently with the recorded acts of the governing body, we are not disposed to ignore their example of moderation. It may be reasonably asked, however, what has been done since the meeting of 1867 by the Council to vindicate their position as the representatives of the profession. In the last annual report we find it stated that the Veterinary Bill, which was intended to give utility and force to the provisions of the charter by rendering it penal for a non-qualified man to assume the title of veterinary surgeon, was withdrawn in consequence of the opposition of the Scotch school, which was contending then, as now, for a separate charter of incorporation. The burden of the present report is still the Scotch charter, and under the shadow which the proposed charter seems to cast over the affairs of the veterinary profession, all other important considerations are obscured; even a question relating to the local habitation of the Royal College of Veterinary Surgeons, a matter which just now demands some attention, was deferred to "another year," that it may be seen whether or no a Scotch charter will be granted. Mr. Ernes, in his remarks upon this point, suggested that in such event the Scotch schools, by lowering the fees demanded of intending graduates, and maintaining the short period of study would effectually prevent the progress of the London College, and it would be perhaps necessary to go without a habitation at all. Mr. Lawson did not realise Mr. Erne's objection; he could

not see how the advance of the London Veterinary College could be impeded by the proceedings of the Scotch Veterinary College. Admitting, as we readily do, the desirability of independent action, it cannot be denied that pupils who naturally, if left to themselves, seek to avoid the payment of high fees, the endurance of a long course of study, and the ordeal of a searching examination, will if they can, at another legally recognised institution, obtain their diplomas on easier terms. For this reason we should deprecate a want of uniformity of action among the schools in reference to the educational system, irrespective of political complications. So far, however, from our having at this time to deplore and protest against the retrograde movement of the Scotch schools, we are bound to point to the fact that the Edinburgh Veterinary College has established a *summer session,* during which lectures will be delivered and practical instruction given on the subjects of pathological anatomy, botany, and materia medica, in addition to lectures on veterinary medicine and surgery.

If this means shortening the period of study and curtailing the curriculum, we should be glad to see the principle generally adopted. Our opposition to the proposed charter is based, and has been from the first, upon a firm conviction of its non-necessity and essentially mischievous tendency; but we are, as we have always been, decided advocates for an improved system of veterinary education. We have not hesitated to protest against ancient errors, and shall not refrain from applauding innovations which are of a progressive character, whenever and by whomsoever they may be originated.

The small space in the discussion allotted to the consideration of the means of improving the scientific status of the veterinary profession was exclusively occupied by a passing notice of Mr. Hunting's suggestion of a preliminary examination to be instituted by the corporate body, so that the professors at the colleges shall not be placed in the invidious position of having to decide whether or no they will admit a candidate for pupilship. There seems to be an impression abroad that such an examination is not within the province of the corporate body, and that the powers conferred

by the charter are not of a character to permit such a proceeding to be legally adopted. Taking a common-sense interpretation of the clauses of the charter, it seems to us that the Council have absolute and unlimited power in respect to the institution of examinations, and that there is really no substantial difficulty, if the colleges are not opposed to the step, in the way of a matriculation examination being established by order of the Council, and conducted by examiners appointed by them. In any case examinations, at some time or other, can be made the test of the pupils' efficiency; and therefore, as we have over and over again contended, upon the Council, elected as it is by the whole body of the profession, devolves the responsibility of guarding the several political and educational interests of the Corporation; and were it not for the lukewarmness to which the President alluded there would every year be a crowded meeting of members, anxious and determined to know how the trust which had been committed to their representatives had been fulfilled. An effort in the right direction was made a few months back, when Professor Gamgee gave notice of motion for altering certain bye-laws relating to the examinations. The notice lies on the table, and may possibly lie there until another annual meeting shall finds us pretty much in our present position.

Mr. Broughton said, "the members of the profession are very slow to move; but he dared to say that they could be got along with a little trouble;" and the members applauded the sentiment, and seemed to enjoy the idea of being troublesome to get along. There is, however, a serious element in this good-humoured apathy, and that is the want of a motive power sufficiently strong to dislodge us from our calmly contented position; and at this moment we do not see how the want is to be supplied.

Extracts from British and Foreign Journals.

THE EDUCATION OF VETERINARY SURGEONS.

In our last number we drew attention to the scheme of the "Training College" for the education of veterinary pupils in particular, which we stated had our full concurrence. This subject is so important, that we do not hesitate to extract from the *Medical Times* the following pertinent remarks, which we doubt not will commend themselves to our readers. The writer of the article says that "We learn with great pleasure that an effort is being made to provide a sound, though simple, general education for young men intended for the veterinary profession. We have before us a prospectus of a 'Training College for intending Students of Veterinary Medicine and Agriculture,' which offers a hope of a very sensible and valuable institution. The list of patrons includes the names of the present and past presidents of the Royal College of Veterinary Surgeons and the whole staff of examiners, including the well-known names of Professors Sharpey, Miller, and Taylor. The professors in the Royal Veterinary College and the principal veterinary surgeon to the army have likewise contributed their names, and the example has been followed by several of the leaders of agricultural science in England, such as Brandreth Gibbs, Esq., Dr. Gilbert, J. B. Lawes, Esq., and Professor Voelcker. The scheme is also deservedly supported by many who have only a general interest in its success, and we are glad to observe the names of Professors Anderson, Frankland, and Rolleston, and Dr. B. W. Richardson, among the list of patrons. The principal of the new College is to be Professor Tuson, of the Royal Veterinary College, to whose exertions the enterprise is, we believe, mainly due. The proposed course of study is, of course, very simple, comprising English, arithmetic, zoology, botany, physics, and chemistry; and for the more advanced pupils, Latin, French, geometry, and algebra. Students of average intelligence might, it is believed, pass through such a course in a twelvemonth. The very simplicity of the education suggested illustrates the extreme need of it which exists. Enlightened veterinarians are constantly striving to raise the social position of the members of their profession; and in doing so they receive the cordial sympathy of all unprejudiced medical men. But what chance of success can they have as long as the standard

of education remains as low as it is now? It is not any mere class prejudice, as a general rule, which prevents the medical man in a country town from associating with the local 'vet.' He would often be only too glad to make a new friend in any social position, provided he could find one of kindred tastes and culture to his own. Make your veterinarian a gentleman and a man of science, and he will soon have no cause to complain of want of social position. We can easily understand the cordiality with which the new scheme must be received by the professors and examiners of the London College. The success of teaching depends so much on the previous knowledge of the student that every wise teacher will be sure to rejoice at anything which promises to give him a more cultivated and better prepared class; and however slight the education which the new College imparts, it cannot fail to turn out students who have mastered enough of the elements of knowledge to make their subsequent course of study rapid and profitable."—*Medical Times and Gazette*, May 2, 1868.

THE ATMOSPHERIC GERM THEORY.

(*A Lecture delivered to the Royal College of Surgeons, January* 17, 1868.)

By John Hughes Bennett, M.D., F.R.S.E., Professor of the Institutes of Medicine and Senior Professor of Clinical Medicine in the University of Edinburgh, &c. &c.

(*Continued from* p. 311.)

M. Pasteur thinks that these drawings indicate the number of organised corpuscles that may be arrested in a small mass of cotton through which 1500 litres of air, in one of the less-frequented streets of Paris, have passed in twenty-four hours, about three or four yards from the ground. These he estimates at several millions in a litre (p. 29).

Now, it must be remembered that M. Pasteur is a chemist, and it will be admitted by every histologist that no method could be more unsatisfactory for determining either the nature or the number of the corpuscles than the one he adopted. The solution of the cotton in ether, the frequent soakings in water, the desiccation, and then the addition of a solution of potash, must completely alter the character of any living corpuscles in the atmosphere. Then the forms he assumes to be organic, are not necessarily so. They are exceedingly frequent among mineral substances, and siliceous rounded forms are common, which of course resist sulphuric acid.

Numerous investigations have been made, both before and since M. Pasteur wrote, to determine the nature of dust floating in the atmosphere—of that dust, for example, which a ray of sunlight reveals to us, when admitted into a chamber. It consists, for the most part, of different kinds of starch corpuscles; the debris of clothing, especially filaments of cotton, silk, and wool; the results of different kinds of combustion, whether of coal or of wood; various mineral bodies, globular or ovoid, amorphous or crystalline; and minute fragments of insects and vegetables; very rarely small seeds and microscopic animalcules.

These constituents vary to such an extent in different localities, as to enable the observer, in some cases, to determine whence the dust was collected. Starch corpuscles abound in the neighbourhood of flour-mills and bakeries; fragments of clothing where there have been crowded assemblies of persons, cotton and wool being predominant if the persons belong to the poorer classes, and silk if the upper classes have been present; the products of combustion predominate in smoky localities; mineral particles on the roads and highways; seeds, fragments of vegetables and insects, in market places, gardens, &c. &c. But although these constituents of the air vary in different places, infusoria, produced in all of them, are identically the same.*

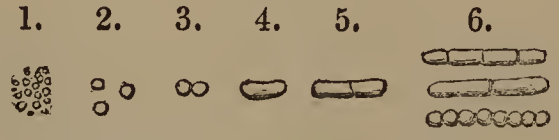
This has been tested in various ways. The dust has been ransacked to discover organic germs,—collected and carefully examined with the microscope, near the soil, and on the summits of the highest buildings, not only in frequented, but in desert places; in crowded assemblies, as well as in empty Gothic cathedrals and ancient vaults—in the ancient palace of Karnack, on the banks of the Nile; in the tomb of Rhamses II, at the extremity of the Desert, as well as in the central chambers of the great pyramid of Gizeh. The chief element of the dust collected in these places has been found to be starch corpuscles.† Large quantities of air have been drawn through tubes by aspirators, and collected on cotton, in distilled water, or projected on glass. The feathery snow, which, falling through the atmosphere, may be well supposed to collect its contents, has been melted, and the precipitate carefully collected. The emanations of marshy places, such as those of the Maremma in Tuscany, have been specially investigated.‡ The larynges and mucous pulmonary surfaces

* Pouchet's 'Nouvelles Expériences,' p. 73, *et seq.*
† Pouchet's 'Hétérogénié,' p. 446.
‡ L. Gigot's 'Récherches expérimentales sur la Nature des Émanations

of numerous animals have been explored, even to the inmost bone cavities of birds. On the summit of Mont Blanc, amidst eternal snow; on the glaciers of the Jura and of the Pyrenees, and in the deep crevasse;* on the burning plains of Egypt, and in the markets of Constantinople, the dust of the atmosphere has been microscopically examined,—and in all with a like negative result as to the existence of germs. Nowhere could they be seen, or if a few, in the opinion of some, were visible, could they in any way account for the multitude of minute infusoria, which, in all these localities, not only readily spring up in putrid fluids, but in every instance are identically the same.†

Indeed, on examining the drawings of M. Pasteur (see figs. 6 to 9), let us suppose that the few bodies he has figured are truly spores, as he believes them to be, which have preserved their form—after the action of ether, several soakings of twenty-four hours each in water, the desiccation, and subsequent mixture with a weak solution of potash. How, it may be asked, could these bodies produce the incalculable millions of minute molecules in the smallest fragment of the pellicle we can transfer to our microscopes, in which, as we have seen, the infusoria originate? It has been supposed that, on falling from the air, they undergo rapid division, and spread over the surface with the greatest rapidity; but no one has ever seen this remarkable phenomenon, and the slightest consideration must show that such an assumption is completely adverse to what can be readily demonstrated on the surface of every infusion. Thus, there can be no doubt that the minute molecules are formed first, and the bacteria, vibrios, and filaments, last. Supposing that the primary molecules, figured No. 1, enlarge to a certain point,

Fig. 11.



Stages in the Development of Vibriones.

No. 2, and then divide, how is it possible to explain the formation of elongated filaments at all? Surely the idea of their rapid multiplication by division is opposed to that of their power of elongating into bacteria and vibrios, whether

marécageuses,' Paris, 1859. 'Récherches sur l'Air des Maremmes de la Toscane,' par M. E. Bechi. 'Comptes Rendus,' tome iii, p. 852.

* 'Comptes Rendus,' tome lvii, p. 558.

† 'Nouvelles Expériences,' p. 75.

by aggregation or growth from their extremities. It may frequently be seen that No. 3 is composed of molecules of exactly the same size as No. 2, which are floating loose,—a fact in favour of their coalescence rather than of their division, as then they would be reduced to half the size. It is more probable that although the smaller molecules may increase by imbibition of fluids, they have yet a constant tendency to aggregate together and melt into one another. No. 3 is not a proof of No. 2 dividing, but of two molecules coalescing; and when they unite, they form No. 4. Two or more of these uniting, form Nos. 5 and 6. When a similar process to this goes on in mineral bodies, as shown by Mr. Rainey,* it cannot suggest division, but union; and this for the obvious reason, that the former would lead to disintegration, whereas, it can be seen in one case as in the other, that development is the result. In short, in the same manner as a tube is formed by a coalescence of cells, so is this minute vibratile vibrio formed by the coalescence of molecules. It may be argued, however, that each molecule elongates itself—that is, No. 2 is converted into No. 4; this into Nos. 5 and 6; and that No. 3 are sporules or ova, caused by the disintegration of No. 6. But this view is opposed by the fact that Nos. 1, 2, and 3 are seen before Nos. 4, 5, and 6 are produced. Of this all have satisfied themselves who have examined animal and vegetable infusions; and the conclusion, therefore, cannot be resisted, that the vibrios are derived from the molecules, and not the molecules from the vibrios.

But it may also be supposed, that while some have the property of dividing, others are capable of elongating or aggregating; but this view is not only opposed to observation, but is at variance with all that we know of embryonic development in plants and animals. When a plant consists of a single structural element, such as a cell or a tube, it will, I think, be admitted that growth in the sense of increased bulk, and growth in the sense of multiplication of parts by division, do not proceed at the same moment of time. Every plant and animal follows, in this respect, the same law. Nutrition is carried on up to a certain point of maturity, and then, and not till then, does generation, or the separation of parts to form new creatures, take place. When plants and animals are complex in their structure, one organ or segment may be growing, while another is disintegrating; but in individual organs there is a period for growth and reparation,

* 'On the Mode of Formation of Shells,' etc., 8vo, London, 1855, p. 12.

and a period for division or separation. Hence, it seems to me, I am correct in thinking that if the primary molecules in the fibre of an infusion possess the property of dividing, they cannot also, at the same moment, possess the property of elongating and forming filaments. The one function is subversive of the other. While, then, a cell or a vibrio may possess the property of growth and division, these two functions must be exercised at different periods of time,—so that, in reference to the early stage of formation, if the molecules divide, bacteria, vibrios, and filaments could not be formed. A mass of vibrionic molecules is not a compound organism; it is a mere aggregation of similar simple elements. Each of these in passing through certain phases of development may be arrested, or reach maturity at various periods, so that we frequently see different forms present at one time; but that the same forms and the same stages of growth should exhibit directly opposite functions, is surely not in accordance with physiological knowledge.

The conclusion we must arrive at therefore is, that the molecules seen on the surface of infusions out of which animalcules and fungi are produced, are not derived from the air.

Neither can they be supposed to pre-exist in the fluid, as then they would be readily seen, which they never are at the commencement. On this point nothing can be clearer than the microscopical evidence, so that it results from the facts and arguments I have brought before you, that the more simple infusoria do not originate from cells or minute germs at all, whether in the atmosphere or in the fluid. This is the almost universal conviction of histologists who have carefully investigated the matter.

(*To be continued.*)

ROYAL COLLEGE OF VETERINARY SURGEONS.

ANNUAL MEETING.

The twenty-fifth general meeting of the members politic and corporate of the Royal College of Veterinary Surgeons was held by advertisement, and in accordance with the provisions of the Charter, on the first Monday in the month of May, being the fourth day thereof, one thousand eight hundred and sixty-eight, at the College, No. 10, Red Lion Square, Holborn, London.

Present: The President, Wm. Field, jun.. Esq., Professors Simonds, Brown, Pritchard, and Armatage; J. Wilkinson, Esq. (Principal Veterinary Surgeon to the Forces), and W. J. Goodwin, Esq. (late Veterinary Surgeon to the Queen); Messrs. Broad, J. C. Broad, A. Broad, W. D. Barrow, A. Bagg, H. T. Batt, R. Beart, P. Boughton, Thos. Burrell, jun., W. Clark, Matt. Clarke, M. Case, B. Cartledge, Jn. Carless, W. A. Cartwright, C. L. Cartwright, Alex. C. Cope, Thos. Corby, J. G. Cattrall, John Doris, W. Ernes, John Field, Geo. Fleming, J. W. Gowing, T. W. Gowing, jun., Thos. Greaves, H. P. Gudgin, Jas. Hall, M. J. Harpley, E. O. Harrison, W. Helmore, R. L. Hunt, Chas. Hunting, W. Hunting, Danl. G. Hunting, Fred. Jarvis, J. E. Jarvis, W. H. Kent, Stephen Knott, John Lawson, J. H. Lemon, G. A. Lepper, Clemt. Lowe, Jas. A. M'Kenna, C. H. Martin, Jas. Moore, Jas. Moore, jun., Robt. Moore, Jas. Moon, Geo. Morgan, Rupert Mosley, W. Murch, G. Olden, E. Price, jun., R. Pritchard, W. Robinson, Jas. Rose, Jas. Rowe, jun., F. T. Stanley, Rodney Strutt, Griffith Thomas, Saml. Tremlett. F. Watkins, Joseph Woodger, Joseph Woodger, jun., Ed. Woodger, W. Wilson, J. H. Withers, Hy. Withers, Alf. Withers, F. Wragg, F. W. Wragg, and the Secretary.

Wm. Field, jun., Esq., the President, in the chair.

The minutes of the preceding meeting having been confirmed,

The *President* stated that he had received a letter from Mr. Thomas Walter Mayer, an old friend and supporter of the profession, expressing regret that he was prevented attending the meeting. The President remarked that he was afraid there was a great deal of lukewarmness in the profession. He recollected that at the first annual meeting he attended the room was quite full. That was ten years ago; five or six hundred members had joined the college since then, yet the attendance was not nearly so good.

The *Secretary* read the minutes of the last meeting, which were confirmed.

The *President* then called upon the Secretary to read the Abstract of Proceedings for the past year.

Mr. Ernes said that, before this was done, he would claim the attention of the meeting for a few moments. This was a royal chartered body. A member of the royal family had recently had a narrow escape from being assassinated. A great many loyal addresses had been presented to Her Majesty, congrtaulating her and expressing thanks for the escape of her son, the Duke of Edinburgh, and he thought it would not be out of place before proceeding to any further business to move that a similar loyal address should be presented by the Royal College of Veterinary Surgeons.

The motion was carried by acclamation.

Mr. Helmore asked how the address was to be prepared and presented.

The *President* said he thought the profession would be perfectly satisfied to leave the matter in the hands of the council.

Mr. Ernes moved that the following members of the council form a committee to carry out the resolution: the President, the Secretary, Professor Simonds, Mr. Wilkinson and himself as the mover.

The motion was agreed to.

The Secretary proceeded to read the Twenty-fourth Annual Report of the Council of Royal College of Veterinary Surgeons, including the Treasurer's Annual Balance-sheet.

Report.

"The Council of the Royal College of Veterinary Surgeons in presenting to the Body Corporate this the twenty-fifth Annual Abstract of their Proceedings, desire to confine their statements to a brief *résumé* of the occurrences of the year—occurrences many of them of much importance to the Veterinary profession. Before alluding to these, however, the Council have to report that Wm. Field, jun., Esq., was elected President for the year 1867-8.

"The following gentlemen were also elected Vice-Presidents, viz., Messrs. Thacker, Fleming, Goodwin, Gowing, Lepper and Cowie; Mr. S. H. Withers was again elected Treasurer, and Mr. Coates, Secretary and Registrar.

"The most important subject occupying the attention of the Council, during the past year, has been the application made to Government by certain authorities in Scotland for

a separate Charter for that country, empowering them to grant diplomas and act otherwise independently of the Corporate Body. In order to guard against the injury such additional charter would produce, the Council felt it imperatively necessary to lay before the Government various statements connected with the existing Charter of Incorporation. With this object in view several meetings have been held and deputations appointed. The result of these deliberations and interviews may be briefly alluded to.

"The Parliamentary Committee having informed the Council that negotiations were going on with the Privy Council Office on the subject of granting a separate Charter to Scotland, it was determined that a deputation from the Council of the Royal College of Veterinary Surgeons should wait upon His Grace the Duke of Marlborough, Lord President of the Council, and inform him that the application which had been made to Government for a separate Charter would, if granted, be extremely detrimental to the interests of the Veterinary profession.

"Arrangements were made for the deputation to wait upon His Grace on July 10th. It consisted of the President, W. Field, jun.; Professors Spooner and Varnell; Messrs. J. C. Broad, Cowie, Ernes, Goodwin, Gowing, Fleming, Harpley, W. M. Wilkinson, Esq. (the legal adviser of the College), and the Secretary.

"The deputation was introduced by C. N. Newdegate, Esq., M.P., who explained to His Grace the object which the deputation had in view.

"The Lord President made several inquiries relative to the governing body, and the members who formed the Examining Boards acting for England and Scotland.

"His Grace appeared to be duly impressed with the explanations given, and also with the importance of upholding the standard of education in Veterinary Science, and promised the deputation that the subject should have his most careful consideration.

"Subsequently a letter was received from the Lord President, informing the Council 'that a petition for the grant of a Charter to a Veterinary College in Scotland and several petitions from Agricultural Societies had been presented to the Queen and referred by Her Majesty to the Board of Trade.' A request was also made that a written statement of the grounds of objection to the grant of the Charter prayed for, and which the Council of the Royal College of Veterinary Surgeons might wish to have considered by the Lords of the Committee of Council for Trade should be given.

"The Council having prepared their reply, stating the grounds of their objections to the grant of a Charter to Scotland, forwarded it, through their President, to His Grace the Duke of Richmond, President of the Board of Trade.

"In the absence of the legal adviser to the College, Messrs. Loch and Maclaurin, parliamentary agents, were instructed to watch the proceedings on behalf of the Council, and report any information which they might receive concerning the matter.

"In addition to the letter forwarded by the President of the College to the Board of Trade, the Parliamentary agents prepared a draft statement of objections to the granting of the Charter, which they submitted to the Council for their consideration. The statement thus submitted was duly considered, and afterwards returned to Messrs. Loch and Maclaurin, in order that it might be laid before His Grace the Duke of Richmond, together with a memorial from the Yorkshire Veterinary Medical Association on the same subject.

"Afterwards, in consequence of a communication, received from the Parliamentary agents, relative to the advisability of an influential deputation waiting upon His Grace the Duke of Richmond in order to urge objections to the granting a Charter to Scotland, a second deputation from the Council of the Royal College of Veterinary Surgeons had an interview with His Grace at the Board of Trade, on the 28th of November.

"The deputation was introduced by C. N. Newdegate Esq., M.P., and E. Holland, Esq., M.P. It consisted of the President, W. Field, jun., Esq., J. Wilkinson, Esq., Principal V.S. to the Army, Professors Spooner, Simonds, Gamgee, and McCall, Messrs. J. C. Broad, Cowie, Ernes, Goodwin, Gowing, Greaves, Harrison, Lawson, Lepper, Moon, Robinson, Withers, and the Secretary.

"Mr. Newdegate explained to His Grace the relative position of the holders of the diploma of the Royal College of Veterinary Surgeons, and of the certificate of the Highland and Agricultural Society, and further stated that the several Colleges or Schools submitted their pupils to an examination under a Board of Examiners, and that the same regulation was observed in Edinburgh as in London. He also pointed out that the Charter of Incorporation was granted in 1844, that it embraced the United Kingdom, and that the late Professor Dick was one of the petitioners for it to the Government.

"He considered that, the profession being numerically small, the granting of a second Charter would be most detrimental

to its interests, and that nothing could be more injurious than the institution of two corporate bodies, which must necessarily act antagonistically to each other. Mr. Newdegate further explained that, in order to raise the status of the profession, the Royal Veterinary College, which is the *alma mater* of the profession, had now adopted a preliminary examination with a view to test the education of students previously to their admission into the College.

"Mr. Holland also assured His Grace that the profession was not sufficiently numerous to allow of a second Charter being granted, and drew his attention to the fact that since the obtainment of the Charter, 818 persons had received the certificate of the Highland and Agricultural Society, and that of these 595 had, in addition, passed the examination, and become members of the Royal College of Veterinary Surgeons, thereby plainly indicating the non-necessity for such an application being made to the Government.

"His Grace was addressed by Professors Spooner, Gamgee, and McCall, Messrs. Wilkinson, Cowie, Lawson, Robinson, and others.

"His Grace observed in reply that the provisions of the Charter were ample, but it was necessary that the standard of education should be raised, as had been the case in the medical profession. He was bound to hear both sides of the question, and would take time to consider the merits of the objections which had been brought under his notice by the members of the body corporate before he came to any decision upon the matter.

"Memorials from the Lancashire, Liverpool, North of England, Midland Counties, and Yorkshire Veterinary Medical Associations, have likewise been laid before His Grace the Duke of Richmond, setting forth that the Associations 'were unanimously opposed to the granting of a Charter to Scotland, as calculated to be highly prejudicial to the interests of the veterinary profession. That the working of the present Charter was complete and satisfactory, as the Scotch students incurred no more trouble or expense in obtaining the diploma than the students in London, and that it would be exceedingly objectionable for any teaching school to have a power in the appointment of an Examining Board for its own pupils. Further, that the petitioners viewed with anxiety the granting of a separate Veterinary Charter for Scotland, and they prayed that the Honorable Board would reject the said application.'

"The subject is still in abeyance; but it is, nevertheless, earnestly hoped that the exertions which have been made

by the Council may be productive of good results, and tend to maintain intact and inviolate the unity of the profession.

"Presentations have been made to the Library and Museum of the College by Dr. A. S. Taylor, Professors Morton and McBride; also by Geo. Fleming, Esq., F.R.G.S., of the Royal Engineers.

"The Council regret having to announce that Dr. J. W. Begbie, one of the Members of the Scotch Court of Examiners, who for many years officiated at the chemical table, has tendered his resignation on account of increasing professional engagements. The vacancy thus caused was filled by the election of Dr. Alexander Crum-Brown, of Edinburgh, who the Council feel assured will prove a most efficient successor to Dr. Begbie.

"Seventy-two pupils from the different schools have received the diploma of the Royal College of Veterinary Surgeons during the past year, and twenty have availed themselves of the Special Examinations, making a total of ninety-two members who have been admitted into the body corporate.

"Reference having been made to a change in the locality of the College, a central situation being deemed more in accordance with the status of the profession, several members of the Council have expressed their willingness to contribute funds for that purpose.

"Since the last issue of the Register, the increased number of members admitted into the body corporate has rendered it necessary that a new copy should be prepared for general circulation. Instructions have consequently been given for one to be compiled and published with as little delay as possible.

"The number of members of the body corporate whose deaths have been recorded during the past year is thirty, and among them will be found some of those who have devoted their time and energies to the best interests of the profession. The Council especially have to regret the death of Professor Morton, who at the time of his decease held the office of Examiner on Materia Medica and Therapeutics. Professor Morton was elected a Member of the Council in 1850, a post which he continued by re-election to hold for a period of ten years; he was also the Treasurer to the College for four years. These offices he resigned at the time of his retirement from the Chair of Chemistry at the Royal Veterinary College. Last year the Council, having regard to the devotedness of Professor Morton to the profession with which he had for so many years been associated, elected him as their President; but declining health and advancing age prevented his acceptance of the office. It may be mentioned

in further proof of the interest which Professor Morton took in the advancement of Veterinary Science, that on the obtainment of the Charter of Incorporation in 1844, he was the first to present himself before the New Court of Examiners as a candidate for the diploma of the Royal College of Veterinary Surgeons, that he might, even as an old teacher, take his place among the members of the body corporate.

"The Financial Statement is annexed. The balance in hand, after defraying the expenses of the year, amounts to £529 4*s.* 9*d.*"

S. H. Withers, *Treasurer, in Account with the Council of the Royal College of Veterinary Surgeons.*

From April 1st, 1867, to March 31st, 1868.

Dr.	£	*s.*	*d.*
Balance at Banker's, April, 1867	485	17	1
Examination Fees	664	13	0
Interest	7	13	11
Property Tax	1	5	0
	£1159	9	0

Cr.	£	*s.*	*d.*
Examiners' Fees and Expenses	304	6	11
Rent	60	0	0
Rates and Taxes	32	3	2
Salary to Secretary	100	0	0
Insurances	3	6	6
Advertisements	8	5	5
Printing	16	3	0
Stationery and Postage Stamps	13	10	5
Reporters	8	8	0
Coals, Gas, and Wood	13	5	0
Furniture	2	12	6
House Repairs and Repainting outside	26	5	4
Wages	20	0	0
Petty House Expenses	21	18	0
Balance at Banker's	529	4	9
	£1159	9	0

We, the undersigned, have examined the above accounts, and have found them correct,

JOSEPH WOODGER, Jun., } *Auditors.*
EDWARD COLEMAN, }

April 7th, 1868.

It was moved by *Mr. Helmore*, and seconded by *Mr. Wilson*,

"That the report be received."—Carried.

Professor Simonds, before the motion was put, wished to call attention to a statement which had occurred in the report. It was stated in pages 2 and 3, that "a letter had been received from the Lord President of the Council informing the Council of the Royal College of Veterinary Surgeons 'that a petition for the grant of a Charter to a Veterinary College in Scotland had been referred to the Board of Trade.'" Was it really the case that the Lord President had sent such communication, or had it come from the President of the Board of Trade? It was rather important that the meeting should be correctly informed upon this matter. He hardly thought that the Lord President would write to the Council, simply to inform them that a communication had been received from a certain quarter, and that it had been referred to the Board of Trade.

The President replied that the letter came from the secretary to the Duke of Marlborough; therefore it was a clerical error.

Professor Simonds said if it came from his secretary it was the same thing.

Mr. Coates produced the letter.

Professor Simonds said that on referring to the letter he found that it had been sent from the Lord President of the Council, the Duke of Marlborough, but though the report was thus far correct, it was wrong in another. It stated that in consequence of "a change in the administration" the Parliamentary committee found the proceedings of their former application had been transferred from the Privy Council Office to the Board of Trade. The change in the administration was most certainly not the reason. The letter of the Lord President distinctly stated that the matter was referred to the Board of Trade by her Majesty, who had received several petitions from parties in Scotland for a Charter. That being so, the passage in the report was altogether incorrect, and must be struck out, and the real facts mentioned.

Mr. Wilkinson asked if the inaccuracy was of sufficient importance to require the report to be reprinted and recirculated.

Mr. Morgan suggested that as the report would no doubt be published in the *Veterinarian*, it would answer all purposes if it were inserted in its amended form. He begged to move that the report as amended be received.

Mr. Gowing seconded the motion.

Mr. Ernes said it did not reflect much credit on the Council that a report should be laid before the body corporate which was not correct, and he hoped that in future when a report was drawn up there would be greater care taken. He was afraid that this report was rather hastily prepared. The Committee had had but few meetings, and he regretted to say, as a member of that Committee, he could not be present at one of them. He wrote a letter and expected that there would be another meeting, but there was not. The report was considered by the Council, and it was so far corrected that it was thought to be presentable. It certainly was not very creditable that it should have to be corrected at the present meeting.

Mr. Wilkinson said there was also a clerical error in the second paragraph in describing the gentlemen there mentioned as vice-presidents. This was not, however, a very important matter, and he would pass it over. But there were two other passages to which he must call attention. In page 5, in the second paragraph, it was stated with reference to the vexed question of the Charter that the associations mentioned were unanimously of opinion that the Charter prayed for by the Scotch people ought not to be granted. Now, he could not say whether that was correct or not, but he had heard that the associations were by no means unanimous, and in sending forth a report to the public, he thought they ought to be very careful to state only that which could be borne out by actual facts; otherwise their opponents, being able to contradict them on any one point, would throw discredit upon the whole of their assertions. The other passage which he would remark upon was that which alleged it to be exceedingly objectionable for any teaching school to have the power of appointing an examining board for its own students. Of course the reference there was to the teaching school in Edinburgh. The statement was very strong, and might be very good, but it was an assumption which they were hardly justified in making, because he did not for a moment believe that the teachers of any Scotch school, if the Charter were to be granted to-morrow, would appoint their own examiners. If there was any authority either for the statement as to the unanimity of these associations or for the allegation as to the power which the teachers of the Edinburgh School, or any other school, would be likely to insist upon, of appointing their own examiners, he should be glad to be corrected.

Mr. Hunting, *Mr. Morgan*, and *Mr. Greaves* testified to

the accuracy of the report as to the unanimity of the associations, with the exception of Lancashire, in which, however, there were only three dissentients.

Mr. Helmore thought the meeting was indebted to Mr. Wilkinson for bringing these matters forward, because the principle he had laid down was a very good one with regard to anything being stated which might be said to be untrue. As to the passage about teaching-schools appointing their own examiners, he thought it would be seen by the context to be not so much an assumption of an existing fact, but an assertion of something which would be objectionable as a matter of principle.

The motion for the reception of the report, and publication in the *Veterinarian* in an amended form, was carried unanimously.

Mr. Helmore said he would be glad if any gentleman could inform him whether any of the Scotch Veterinary Associations had expressed themselves on the subject of the Scotch Charter, either for or against it.

Mr. Armatage said there were only three Veterinary Associations in Scotland at the present time, one at Glasgow, one at Perth, and another (which had been formed within the last few weeks) at Aberdeen. In each instance petitions had been framed which were decidedly in favour of the granting of the Scottish charter. The expression of opinion in that way seemed to be unanimous. In fact, memorials had been presented which had been got up by the secretary, or rather, the gentleman who was seeking for the post of secretary for the new college. He had been sending round a vast number of copies of the petition, to which each person attached his signature. The substance of this petition had been embodied in one sent to the Duke of Richmond, as President of the Board of Trade, and of course these petitions were sent as counterparts of the original. The great argument was that the largest part of the money which the petitioners had spent hitherto had been going to London to support a foreign establishment, and they would rather use the money at home in support of an establishment of their own.

The President said the next business was to appoint scrutineers to report on the balloting-papers.

Mr. Ernes said the report had not yet been adopted. It had only been received, and when a report was received it was ready for discussion.

The President thought Mr. Ernes was in error.

After some discussion it was ascertained that the form of

the motion had only been for the reception of the report, not its adoption.

Mr. Ernes said he believed this was the time for him to make some general remarks on the report. It was a very meagre one, but he did not know how it could have been otherwise. It correctly stated what had been done by the Council, though that was very little. He believed it had not been in the power of the Council to do more. They had in this session acted more on the defensive than otherwise. The Act of Parliament for which they had been working so long they had not been able to bring forward on account of this Scotch charter. The Council had been doing all they could to prevent that Charter from being granted. Not that they had any opposition to the interests of Scotland; quite the contrary. He believed every one agreed that Scotland should be treated in the same way that England was, it being an integral part of the kingdom (hear, hear). He believed that the granting of a Charter to Scotland would be the greatest bane to the profession possible; in fact, he should say it would be the destruction of the progress of the profession. It would put them back, or if not, it would keep them in the same position they had been in for so many years. When Veterinary Science was introduced into this country, the veterinary education was founded on the basis of continental schools, and how was it, he would ask, that they remained so far behind? Was it because they did not follow out the regulations which had been laid down for them? If so, why did they not follow them out? He could only say that the reason was that an opposition school was established in Edinburgh. That competed, not for science, not for education, but for cheapness. It was a private establishment; the money went into the pocket of a private individual. He obtained the patronage of the Highland and Agricultural Society, and under that patronage he undertook to teach Veterinary Science. And how did he teach it? He (Mr. Ernes) did not hesitate to say that it was very imperfectly taught, talented, however, as the teacher undoubtedly was. But that was not the only evil. In competing with the London School, instead of raising the Scotch School to the level of the London School, he brought it down to his level, and hence the position they were in at present. Now, if the Scotch Charter were granted this evil would begin again, in fact it had already begun. What had come from Edinburgh showed at once that they would compete for cheapness and for shortness of session. Members of the profession in this country would like to improve the curriculum

of study, but Scotland would not agree to that. He thought this should be fairly represented to the Government before a Charter was granted. If it was granted he should say "Good-bye" to the profession. They would never rise, but they would go back; they would be pulled down to the level of the Scotch instead of rising to the level of their continental brethren.

A Member suggested that if it had been thought necessary for the secretary of the New College of Edinburgh to send circulars to all the members practising in Scotland, there was no reason why the Council of the Royal College should not do the same to all the members practising in England, and by that means collect a large number of signatures to a petition, and send them in in the same way.

Mr. Wilkinson said he was sure Mr. Ernes would forgive him for correcting one little error into which he had fallen as to the cheapness of the Scotch School over the one in London. It had been communicated to him (Mr. Wilkinson) that the fees at the College of Edinburgh were now as high as those in London.

Mr. Ernes said he was referring to the late Professor Dick's school, and he was satisfied he was correct in stating that Professor Dick's pupils paid ten guineas or ten pounds, as an entrance fee, while the pupils of the London School, at that time under Professor Coleman, paid twenty. The sessions were short in London, but, if anything, they were still shorter in Edinburgh.

Mr. Wilkinson said Mr. Ernes was speaking with reference to the past, not the present.

Mr. Boughton said, as allusion was made in the report to the removal of the College to a more suitable locality, he should like to know what had been done with the view of carrying out this object.

The President said he was afraid he could not give much information on the point. It was true that on the expiration of the fourteen years' lease, it had been suggested that the Body Corporate might be able to afford better premises, but beyond this he did not know that anything had been done.

Mr. Boughton said he thought that a statement might have been given in the report of the amount of the funds promised, as this would probably have induced other persons to give subscriptions who hitherto had not done so.

The President said he had no doubt the Council would be glad to receive, when the time came, any subscription which Mr. Boughton might be pleased to present to them in fur-

therance of this object. As the members were aware, the Council could not take a house without funds, and at present the College funds were so small that they could ill afford to launch out in that direction. To overcome that difficulty several members of the Council had said, "If the money is not forthcoming from any other source, when the time arrives, we shall be very happy to contribute something towards that special object."

Mr. Boughton inquired when the lease would run out.

The Secretary informed him that there were seven years' more. The Council could, however, have the house taken off their hands.

Mr. Boughton said he should be happy, as an individual, to give £5 a year for the remaining seven years of the lease, and if other persons could be induced to follow his example, a much more suitable building might be obtained. He felt that the present situation of the College was not one that was at all becoming to the profession. If they wanted the public to take notice of them, they must move along, and look alive. At present they looked rather to be in a dying locality than in a living one. The best thing, therefore, for the members of the profession to do, was to stir up the Council, and make them move with the times. The members of the profession were very slow to move, but he dare say they could be got along with a little trouble.

Mr. Ernes said he thought the question had better be postponed for another year, till the members of the College knew in what position they were. The question of the day was whether, if the Charter for Scotland was obtained, they might not have to shut up altogether, or go into lodgings (laughter).

Mr. Hunting, jun., said it appeared from the remark of His Grace the Duke of Richmond, that an argument used on behalf of the applicants for the Scotch Charter was that they proposed to give a more critical preliminary examination. His Grace was reported to have said that it was necessary that the standard of education should be raised, as had been the case in the medical profession. Now he (Mr. Hunting) thought the educational standard of the Veterinary Profession was the one great question to be considered. Without a thorough English education one could not have a scientific education. He was not prepared to make a motion on the subject, because there was already a notice by Professor Gamgee regarding preliminary examinations, but he thought it right to advert to the question in order to enforce upon the profession the necessity of at once adopting a pre-

liminary examination, not by any one school, but by the body corporate.

Mr. Robinson said it must be borne in mind that, according to the Charter, the body corporate had nothing at all to do either with the education of the pupil, or any preliminary examination which that pupil might undergo. All that the body corporate could do was to examine pupils after they had been taught.

Mr. Hunting, jun., suggested that if the body corporate could not apply a preliminary test the examiners could increase the difficulty of the examination. At present the shortness of the Sessions prevented the students from being able to pass a stiffer examination than was instituted, but if the examiners increased the severity of their test the Colleges would find means to bring the students up to the required standard.

Mr. Helmore could not quite agree with Mr. Robinson in the remark that the College had nothing to do with the preliminary examination. The Royal College of Surgeons did not act upon that principle.

Mr. Lawson said there was a preliminary examination established at the London School, and he had the authority of Mr. M'Call to state that one would be established in future at the Glasgow School. It was not at all unlikely that the Edinburgh School would follow suit shortly afterwards.

Mr. Morgan, as a pupil of the Edinburgh School, begged to enter his protest against some of the remarks made by Mr. Ernes on the cheapness and the low level of the Scotch School. The Scotch School, as a rule, had sent forth students who would compete with any who had passed the London College, and there had been some teachers in the School who were quite equal to any who were attached to the Royal Veterinary College. Mr. George Wilson, Professor of Technology, and Mr. Barlow, Professor of Anatomy and Physiology, were men of very great distinction, whom Mr. Ernes seemed to have overlooked. The students of the Edinbugh Veterinary College had generally held their own wherever they had gone, and he was very sorry to hear Mr. Ernes rake up matters which had occurred so many years ago. He had been alluding, no doubt, to matters which had existed twenty or thirty years since, and now that amicability between the two schools was a most desirable object, he (Mr. Morgan) could not but regret the remarks Mr. Ernes had made. Comparisons were always odious, but he thought if comparisons were drawn in the opposite way they would be nearer the truth. Mr. Ernes had said something about

the meagreness of the report. He agreed in that. There was no statement, for instance, of how many times the Council had met, and only one or two matters in which they had been engaged were alluded to. A statement of the number of attendances at the Council meetings would have been very advantageous, because some gentlemen who were elected never took the trouble to attend at all.

The Secretary said there was only one gentleman who had altogether absented himself from the meetings, namely, Mr. Dickens, who was a confirmed invalid.

Mr. Morgan said it would be found that there was more than one.

Mr. Ernes denied having compared the Scotch School with the London School, or having said that the London School was any better, nor had he spoken of the professors. He had only spoken of the general system, and stated that the Scotch School had pulled the London School down to its level. He asked, what could be done in two short sessions of less than six months? Cramming, and grinding, and nothing more. He agreed with Mr. Robinson that the Royal College had nothing to do with the education of the students, but he thought they ought to put the screw on in the examinations. He could say a great deal on that subject. The whole thing ought to be reformed, and a different plan adopted. Instead of giving a quarter of an hour to each pupil, the examinations ought to last for days. It could not be expected that the directors of the schools would go against their own interest, and reject pupils who came with money in their hands, and said, "We will pay you this to enter the College." He held that the preliminary examinations as they were establised were of little avail.

Mr. Lawson said he should not exactly let Mr. Ernes out of this matter so easily. He thought, with Mr Morgan, that Mr. Ernes had reflected very seriously upon the Veterinary College of Edinburgh. He had blamed it for keeping the London College from progressing. Now he (Mr. Lawson) held that the London College had progressed, and had risen to a very high position, and if they wanted to raise it still higher he did not see how the school at Edinburgh would keep them from increasing the curriculum of study or otherwise elevating it. It was a mere assertion without any proof. The school in Edinburgh was established a great many years ago, and though the fees were not quite so large as the London fees were, that had nothing to do with pulling the London School down. The Scotch people had not quite so much money in their hands as the London people, but it

did not follow, because the number was not so large, that the quality of the students should not be as good. Poverty was no disgrace, and it was not always the poorest man who was the least educated.

Mr. Kent said the meeting had heard a good deal about preliminary education and sundry other matters. Mr. Ernes had mentioned, and rather personally, a gentleman who was no more. Now, one thing of all others was necessary, and that was that they should be men and gentlemen. There was no one thing which so degraded them in the eyes of the public as petty quarrelsomeness and calling one another names. He would say that, having received their College education, and been admitted members of the Body Corporate, let them conduct themselves as gentlemen towards each other.

Mr. Ernes appealed to the President for protection. This was a downright insult. He had said nothing against Professor Dick. He had told the meeting that he was a man of great talent, who had a private school of his own. Surely there was no harm in that.

Mr. Lawson said the other was a private school.

Mr. Ernes said he had spoken of the shortcomings of both schools, and as to his having applied anything improper to Professor Dick it was absurd. When people descended to downright personality, accusing him of want of respect to the dead, and stating that he had said things which he had not, he must appeal to the chair for protection. If such things were allowed to go on at this meeting, the sooner it was over the better.

Mr. Wilkinson thought the President had been very patient in listening to a great deal that had been said. He was afraid Mr. Ernes did not know the old proverb that a "Scotch thistle would not bear ruffling." He must say that, with great respect and admiration for Mr. Ernes, he thought some of his observations had better not have been made. The profession was in a critical condition, and he believed the general feeling was for unanimity, knowing that united they would become strong. The Scotch were just as much, he thought, in favour of union as the English. Englishmen had been received in that country in the same cordial spirit as Scotchmen were received in this country, and there was a tendency to soften down things and not aggravate them.

On the motion of *Mr. Helmore*, seconded by *Mr. Boughton*, the report was then unanimously adopted.

The meeting next proceeded to the election of six

members of the Council in the place of those retiring by rotation.

Mr. Wilkinson	proposed	Mr. Field, jun.
„ Cartledge	„	„ R. L. Hunt.
„ Broad	„	„ T. Greaves.
„ J. C. Broad	„	„ Gowing.
„ Morgan	„	„ James Moon.
„ Robinson	„	„ Wm. Pritchard.
„ Lawson	„	„ Fleming.
„ Stanley	„	„ James Rose.
Prof. Simonds	„	Prof. Brown.
Mr. Wilkinson	„	Mr. Morgan.
„ Corby	„	„ Helmore.
„ Gowing	„	Prof. Varnell.

The ballot having been taken, the President announced the result to be as follows:—

For Mr. Moon	50
„ „ Pritchard	46
„ „ Greaves	44
„ „ Fleming	41
„ „ Hunt	41
„ „ Gowing	40
„ „ Field	31
„ „ Brown	20
„ „ Morgan	18
„ „ Helmore	15
„ „ Rose	9
„ Prof. Varnell	5
„ Mr. Moore	1

Messrs. Moon, Pritchard, Greaves, Fleming, Hunt, and Gowing, were then declared to be elected.

Tuesday the 26th of May was appointed for holding the meeting of Council for the election of a President, Vice-Presidents, and Secretary.

Mr. Hunt proposed a vote of thanks to Mr. W. Field, jun., for the efficient and courteous manner in which he had conducted the business of the College as President during the past year.

Mr. Lawson seconded the motion, which was carried by acclamation.

The President, in leaving the chair, said:—Mr. Hunt, and Gentlemen, I feel very greatly obliged to you for the kind manner in which you have expressed yourselves as far as the appreciation of my services is concerned. I need not tell

you that anything I have done or can do for the benefit of the profession I shall be very happy to do.

The proceedings then terminated.

ANNUAL DINNER OF THE PROFESSION.

In the evening of the Annual meeting of the Royal College of Veterinary Surgeons, the accustomed dinner took place at the London Tavern, Bishopsgate Street. The chair was occupied by the retiring President, W. Field, Esq., jun. The gathering was not a large one, but every section of the profession was well represented—Scotch and English Professors, Army Veterinary Surgeons, including the Principal Veterinary Surgeon to the Forces, Town and Country practitioners, surrounded the festive board. The meeting was protracted to a late hour, and several very excellent speeches were delivered; the chief topics being the advantages arising from co-operation and union between the English and Scotch Schools, and the necessity of enforcing a preliminary examination of all who were about to become students. We had hoped to have been able to give a report of some of the principal speeches, and have to regret that the limited space this month at our disposal will not permit of this being done.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

Monthly Council, *Wednesday, May 6th,* 1868, Lord Walsingham, Vice-President, in the chair.

Reports of Committees.

Journal.—Part I, Vol. IV, 2nd series, was laid on the table. Mr. Thompson, chairman, reported the recommendation of the committee that a reprint of Mrs. Somerville's article on Poultry be made, and sold at a cost of 2*d.* each. This report was adopted.

Leicester Meeting.—Mr. Thompson, chairman, reported that the tender for refreshments in the show-yard, made by Messrs. Waldram and Crane, of Leicester, had been accepted. The surveyor reports that possession of a sufficient portion of the show-ground has been obtained to enable the contractor to make satisfactory progress; that no obstruction or hindrance has been experienced, and that no doubt exists but that the works will be completed in ample time for the

show. It is recommended that the general meeting of the Society shall be held on Saturday, the 18th July, at 11 a.m. A request made by the Leicestershire and Waltham Agricultural Society to be allowed to pass their members into the Show-yard by tickets to be purchased of the Royal Agricultural Society of England had been acceded to, the details to be arranged by the Finance Committee. Major Wilson was unanimously recommended as the Steward-elect of Implements. The surveyor was authorised to put himself in communication with the Midland Railway Company's engineer, to arrange the details of the accommodation required for the unloading of heavy machinery in the Show-yard. This report was adopted.

EDUCATION.—Mr. Holland, M.P., chairman, reported that eighteen candidates entered for the Society's honours and prizes; that twelve of these were present at the examinations, and that, in the opinion of examiners who have assisted on former occasions, the competition has been superior to that hitherto experienced. Notwithstanding this, the committee are unable to classify the competitors, nor can they grant any certificates of merit, because the terms approved by the Council require that every candidate should satisfy the examiners in the following subjects, viz.: In the Science and Practice of Agriculture; in Land-surveying, or in Mechanics as applied to Agriculture; and in Book-keeping; consequently to pass in Book-keeping is essential to success. In this subject, however, no one candidate had succeeded in obtaining even the minimum fixed by the examiners, who report: "All the candidates came under the category of 'not passed.'" The committee, therefore, confine themselves to the recommendation of the following prizes being awarded to the undermentioned candidates as having shown respectively the highest merit in each subject named:

The Science and Practice of Agriculture.—Simon Hewens Walton, Farnicombe Farm, Whichford, Shipston, £10.
Mechanics.—Thomas John Elliott, Wilton, Salisbury, £10.
Chemistry.—George Kent Walton, Long Compton, Warwickshire, £10.
Botany.—Richard George Scriven, Castle Ashby, Northampton, £10.
Geology.—Ditto, £5.
Veterinary Science.—Robert Brydon, Burncastle, Lauder, N.B., £10.
Land Surveying.—John Joseph Harle, Haydon Bridge, Northumberland, £5.
Book-keeping.—No award.

This report was adopted.

COMMITTEE OF SELECTION.—Mr. Thompson, chairman, reported that Mr. Lawes, having intimated his intention of

resigning his seat at the Council, the committee had resolved that it be recommended to the Council that Mr. Lawes' resignation be not accepted. The House-list of members of Council to be recommended for re-election having been considered, it was resolved that the small number of members of Council in District A (Durham, Northumberland, and North and East Ridings of Yorkshire) be pointed out; and the name of Mr. Thomas Christopher Booth, of Warlaby, Northallerton, be recommended to fill one of the vacancies caused by the retirement of members of the Council by rotation. This report was adopted.

COUNTRY MEETING OF 1869.—The report of the committee appointed to inspect the various sites offered to the Society at Liverpool, Manchester, and Preston, having been read, the Council were favoured by the attendance of deputations from the above towns:

Liverpool Deputation.—Messrs. Graves, M.P., Laird, M.P., Pim, M.P., Tollemache, M.P., Alderman Hubback, Robertson Gladstone, John Grant Morris, Robson (Borough Surveyor), Thomas Baines, and Sir Philip Egerton, Bart., M.P.

Manchester Deputation.—The Mayor of Manchester and Town Clerk, Mayor of Salford and Town Clerk, the Mayors of Ashton-under-Lyne, Bolton, Rochdale, Stockport, and Stalybridge; Sir James Watts, Kt.; Joseph Whitworth, Esq.; Oldham Whitaker, Esq.; J. W. Maclure, Esq.; J. H. Law, Esq.; Mr. Henry Nield, Mr. W. T. Pownall. The deputation was accompanied and introduced by the Earl of Wilton, Earl of Ellesmere, Lord Egerton of Tatton, Hon. Algernon Egerton, M.P.; Hon. Wilbraham Egerton, M.P.; Right Hon. T. M. Gibson, M.P.; Thomas Bazley, M.P.; Jacob Bright, M.P.; E. W. Watkins, M.P.; John Platt, M.P.; John T. Hibbert, M.P.; Thomas B. Potter, M.P.; Edmund Potter, M.P.; R. N. Philips, M.P.; John Cheetham, M.P.; Lieut. Gray, M.P.

Preston Deputation.—The Mayor of Preston, Miles Myres, Esq.; the Earl of Bective, M.P.; Lord Kenlis; Colonel Wilson Patten, M.P.; Hon. F. A. Stanley, M.P.; Sir T. Fermor Hesketh, M.P.; Mr. W. Lowther, M.P.; Lord Frederick Cavendish, M.P.; Mr. Fielden, M.P.; Mr. W. Marshall, M.P.; Mr. Greene, Whittington Hall; Mr. Dawson Greene, Whittington Hall; Mr. R. Assheton Cross (Chairman of Quarter Sessions of Lancaster); Mr. W. J. Garnett, Quernmore Park; Rev. J. Shepherd, Birley; Mr. George Moore, Whitehall, near Wigton; Mr. J. P. Foster, Killhow, Cumber-

land; Mr. T. Towneley Parker, Rev. L. C. Wood, Mr. Drewry, Mr. Thomas Fair, from the Council of Royal North Lancashire Agricultural Society; the Mayor and Town Clerk of Blackburn, the Mayor of Lancaster, Mr. Alderman Edmund Birley, Mr. Councillor Catterall, Mr. Councillor Gilbertson, Mr. Ascroft (Town Clerk), Preston; and Mr. Garlick, Borough Steward.

These gentlemen having communicated to the Council the fullest local information connected with their respective districts, and having answered satisfactorily the inquiries made of them by the Council, the chairman expressed to them the best thanks of himself and the Council for their kindness in having attended the meeting that day, and for the deep interest they had evinced in promoting the objects of the Society.

The deputations having withdrawn, the Council proceeded to the consideration of the particular locality best suited, under all circumstances, for holding the country meeting next year; and, after some discussion of the respective advantages of each position to which their attention had been called, it was decided in favour of Manchester by twenty-five votes, against eighteen for Preston, no vote being given for Liverpool.

Mr. Torr having moved that the Society hold their country meeting in 1870 in the district comprising the counties of Berks, Buckingham, Hants, Kent, Middlesex, Oxford, Surrey, and Sussex, it was seconded by the Earl of Shrewsbury, and carried.

NORTH OF ENGLAND VETERINARY MEDICAL ASSOCIATION.

The eighteenth quarterly meeting of the above Society was held at Donald's Crown and Thistle Hotel, Friday, April 17th, 1868. Present—Messrs. C. Hunting, President; R. Hall, C. Stephenson, D. Dudgeon, W. Marshall, J. Meikle, R. Brydon, D. McGregor, and the Honorary Secretary.

The minutes of the preceding meeting were read and confirmed. Letters were read from Messrs. Plews, Stockton; and Hedly, of Darlington, regretting their inability to attend the meeting.

Mr. R. Hall, Stockton, read a paper relative to the following cases:

1st. A case of idiopathic emphysema in a cow.
2nd. Paralysis of lower lip of a horse.
3rd. Influenza followed by stringhalt.

4th. Poisoning of young cattle by cotton cake; and,

5th. A fatal disease among lambs.

The particulars of these cases were very interesting, especially those relating to the last one, on account of the success which attended the treatment after the usual means had failed. An animated discussion followed the reading of the paper, in which most of the members took part. The history of the last case is as follows:

On the 3rd of November last Mr. Hall was called to a flock of Leicester lambs belonging to G. Pollard, Esq., of Trafford Hill, near Yarm. On arrival he found that three lambs had died that morning, and one or two previously. He proceeded to make a *post-mortem* examination, and found the lungs much inflamed, and the bronchial tubes completely crammed with thousands of worms. The remaining organs were healthy. On examining the flock he found that several of the animals were affected; they were dull, had a hacking cough, and diarrhœa. He ordered a change of pasture and good food, with corn and cake. All those which had diarrhœa were housed, and got hay, corn, and cake. The whole flock was also dosed with turpentine. A microscopical examination proved the worms to be the Filaria bronchialis. They were generally from two and a half to three and a half inches in length. A portion of diseased lung and some of the parasites were forwarded to Professor Williams, for the museum. He saw the lambs again after the lapse of a day or two, and found them to be still dying, in consequence of which he put all the flock under the influence of prussic acid, ten drops being given night and morning. The acid was found to have a most beneficial effect, stopping the diarrhœa and relieving the other symptoms, although a few fatal cases still took place. In conclusion, Mr. Hall mentioned that Mr. Pollard had bought part of the lambs in the county Northumberland, and that the other part had been bred on the farm. He also stated that the farm was heavily stocked with sheep.

The President proposed a vote of thanks to Mr. Hall for his paper, and expressed himself as having derived both pleasure and profit by being present. He had also no doubt that the rest of the members had profited equally with himself. This was carried by acclamation.

The members then took tea together, during which they related several unusual cases which had occurred in their various practices.

(Signed) Henry Hunter, *Hon. Sec.*

LIVERPOOL VETERINARY MEDICAL ASSOCIATION.

The quarterly meeting of this association was held in the Medical Institution, on the evening of Friday the 8th of May; Mr. G. Heyes (President) in the chair.

In lieu of the reading of an essay, a *Conversazione* was held, at which were present Messrs. G. Morgan, Wilson, and Leather, Liverpool; Whittle, Worsley, T. Greaves, Tom Taylor, and Nottage, Manchester; W. C. Lawson, Woolton; Chas. Dayus, Dorrington; T. Roberts, Oswestry, and the Secretary.

After tea (which had been provided by the President) the Secretary read the minutes of the last meeting of the Association, which were confirmed.

Mr. Morgan inquired whether the Secretary had written to the Lancashire Association respecting the publishing of the names of the qualified veterinary surgeons in the county, when, being answered in the negative, a motion was passed recommending him to do so before the next meeting.

The President then read a letter of thanks from the Misses Lucas, for the letter of condolence which had been forwarded to them from the members of the Association. The Secretary also read a copy of the letter of condolence which had been sent to Mrs. Litt and family of Shrewsbury, with Mrs. Litt's reply to the same.

After the reading of these communications, *Mr. Whittle* proposed that from and after this year the annual subscription be half a guinea instead of a guinea as heretofore, which being seconded, after some discussion, was carried.

Mr. Walley proposed Mr. Elam, of Liverpool, and Mr. Midgley, of Birkenhead, as members of the Association. The former having been seconded by *Mr. Heyes*, the latter by *Mr. Whittle*, were unanimously elected.

Mr. Roberts, of Oswestry, and Mr. Tom Taylor, of Manchester, were nominated as members.

Mr. Morgan then called upon Mr. Wilson to explain his system of shoeing, as advertised on cards, which Mr. Wilson had caused to be circulated, and which was said to prevent all diseases of the feet, or, if existing, to relieve or cure them.

Mr. Wilson said that it was the French system of shoeing modified and improved, and after six months' trial it had answered very satisfactorily. It was simply a plain shoe made from five-eighths iron, in the form of a hunting shoe, without leathers. In putting it on he did not allow a knife to be used, and only the crust rasped down to a level with the sole, nor did he allow the sole or frog to be touched, excepting the ragged portions of them. He considered that the good effected by the shoe was in the less weight of iron, and also fewer nails, thereby lessening the chance of the hoof being destroyed by them; as he thought that using more iron than nature absolutely needed was a mistake, as it makes more

labour for animals. He would insure all horses thus shod with sound feet to commence with, an indemnity against corns, or any other disease of the foot, as long as the system was properly carried out. He considered it suitable for all classes of horses, and stated that he had caused two horses, shod on this system, to be brought to the immediate neighbourhood of the institution. At the suggestion of Mr. Whittle, the meeting adjourned to inspect the shoeing; after which Mr. Tom Taylor asked Mr. Wilson how he thought this system would answer in pumice foot where the point of the coffin bone was nearly through the sole. In answer to this, as also to a question from Mr. Morgan, as to its efficacy in curing canker, Mr. Wilson said he considered both diseases would be benefited by the reduction in the weight of iron, and the pressure that the foot would receive from below. He also considered that most of the diseases, if not all, that the foot of the horse was subject to, were the result of improper shoeing.

Mr. Morgan said that, although Mr. Wilson might prevent disease in some measure by this mode of shoeing, he would never make him believe that disease would either be relieved or removed by it, and he should not be satisfied unless Mr. Wilson would promise to expunge the latter clause from his cards. This Mr. Wilson, at the request of Mr. Whittle, promised to do in the next he had printed.

Mr. Greaves said the system was not a new one, and from remarks made to him by Mr. Collins he had for some time advocated the plan of leaving the sole untouched by the knife. He considered that in hacks and nags the system might answer and probably prevent disease, such as contraction and navicular disease; but in cart-horses, at least in Liverpool and Manchester, where they had to draw such heavy weights, it would never answer. He did not see how it could prevent such diseases as quittor, sandcrack, &c. Mr. Wilson said it would do this by leaving the horn stronger, and by less nails being used.

Mr. Whittle said this principle of shoeing was brought into requisition twenty-six years ago by Mr. Hallen, except that he caused the toe of the shoe to be curved.

Mr. Heyes attributed the system, not to the French, but to Mr. Gamgee, sen., and considered it was especially beneficial in some feet, ashe had himself proved.

Mr. Lawson said the late Professor Dick had adopted the system upwards of thirty years ago.

Mr. T. Roberts, of Oswestry, then brought before the notice of the meeting a pair of obstetric forceps for inserting into the orbits of calves and foals, and stated that he had saved several valuable animals by their aid. They were invented by his father, and he begged to offer them for the acceptance of the Association, for any member to take a pattern of them if he chose to do so.

After a short discussion on the merits of the instrument,

Mr. Morgan proposed, and *Mr. Tom Taylor* seconded, a vote of thanks to Mr. Roberts, which was unanimously carried.

Mr. Dayus then showed a very interesting specimen of serous

tumour, occupying the place of the right hemisphere of the brain in a four years' old cart mare. He first saw the animal on the 18th of July last, on which day she was led seven miles for him to examine her. She was in good condition, and her appetite was unimpaired. She had been ailing for about three weeks; the chief symptom being a tendency to wander to the right side, with occasionally an unsteady gait. There was no evidence of any external injury to the head. He (Mr. Dayus) diagnosed it as an affection of the brain, and gave an unfavorable opinion of the case. He administered cathartic medicine, and applied a blister to the poll, and ordered perfect quietness. The blister was repeated in a fortnight, after which, the animal's condition becoming worse, he administered tonic alteratives, and ultimately introduced a seton over the poll. She gradually became worse, until she was little better than a skeleton, was very drowsy, and constantly describing a circle in a very circumscribed space. She succumbed on the 16th of October.

Autopsy.—All the organs of the body healthy, excepting that the right hemisphere of the brain had become absorbed, the cavity being filled by a tumour, which contained about four oz. of serosanguineous fluid. In the bone opposite the tumour a small hole about the size of a goose quill in diameter was existing, which led him to believe that the tumour must have been the result of external injury.

The specimen was examined by all present, and they expressed themselves highly pleased with it, and much indebted to Mr. Dayus for coming so far to describe such an interesting case. A vote of thanks was heartily accorded to that gentleman.

Mr. Greaves remarked that, could the case have been diagnosed sufficiently early, the operation as performed for hydatids in sheep might have proved successful.

After a vote of thanks to the President for his kindness, the meeting separated, the only regret being that so few of the members, of whom there are upwards of twenty-five, had attended.

THOMAS WALLEY,
Honorary Secretary.

YORKSHIRE VETERINARY MEDICAL SOCIETY.

THE usual quarterly meeting of this Society was held at th Queen's Hotel, Leeds, on Tuesday, the 28th April; the President, Charles Secker, Esq., in the chair; there were also present Professor Williams and Messrs. T. Greaves, E. C. Dray, S. F. Fallding, P. Walker, J. Cuthbert, J. W. Anderton, W. Fearnley, G. Smith, J. S. Carter, James Freeman, J. Patterson, and the Secretary.

Letters of apology for non-attendance were received from Messrs. Naylor, Elam, John Freeman, Joseph Freeman, J. Howell, Thomas Pratt, and B. N. Kirk.

The minutes of the last meeting were read and confirmed.

Mr. George Bourdass, M.R.C.V.S., was elected a member of the Society.

Mr. Faulkner, sen., M.R.C.V.S., Wetherby, was nominated as a member.

Mr. Dray announced to the meeting the death of Professor Morton; and after paying a just tribute of praise to the many excellent qualifications possessed by the late kind and deservedly respected professor, moved the following resolution:

"That this Society deeply deplores the death of Professor Morton, by which the profession, and particularly the *Veterinary Journal*, of which he was a principal editor, had lost a staunch friend. The advancement of science and art he constantly endeavoured to promote by his writings, which were expressed in eloquent diction, and always manifested a pure and elevating tendency. He strenuously advocated the formation of veterinary medical associations as a means to create a firmer bond of union amongst the members of the profession. His urbanity and gentlemanly deportment were well known and appreciated, and he was a kind and sincere friend. This Society is therefore anxious to pay this tribute to the memory of one who possessed such moral worth and scientific acquirements."

The resolution being seconded by the President, was carried unanimously.

The Secretary moved, and *Mr. Dray* seconded—

"That a letter of condolence be sent to the widow of our young and highly respected fellow member, the late Mr. Thos. Horne, Barnsley."

Carried unanimously.

Mr. Freeman gave notice, that at the next meeting he should propose, "That all the meetings of the Society be held in Leeds."

Mr. G. Smith gave notice that he should move as an amendment, "That the Rule stand as it is."

The President hoped that, as Mr. Field, the President of the Royal College of Veterinary Surgeons, had honoured the Society with his presence at its anniversary, as many of the members as could possibly make it convenient to attend the annual meeting of the profession in London on the 4th of May would do so.

Mr. P. Walker then read his paper on "The Diseases of the Sinuses of the Head in the Horse." The essayist minutely detailed the causes, symptoms, and treatment of the various diseases in an exceedingly practical manner. The essay gave the utmost satisfaction to all present. In the discussion that ensued, Prof. Williams, Messrs. Freeman, Greaves, Carter, Cuthbert, Dray, and the President, took part.

Mr. Dray moved, and *Mr. Fallding* seconded, a vote of thanks to Mr. Walker for his useful and interesting paper.

It was ordered that the next meeting of the Society be held at Harrogate in July, when Mr. Godfrey Smith would introduce a paper for discussion.

WILLIAM BROUGHTON,
Hon. Sec.

SPECIAL REPORT OF THE COUNCIL OF ROYAL COLLEGE OF VETERINARY SURGEONS.

A Special Meeting of the Council was held May 26th, for the election of office-bearers for the year 1868-9.

Present: Professor Simonds; Messrs. J. C. Broad, Cartledge, Ernes, Field, Fleming, Gowing, Greaves, Harrison, Harpley, Hunt, Hunting, Lawson, Moon, Pritchard, Robinson, Wilkinson, Withers, and the Secretary.

It was moved by *Mr. Hunt*, and seconded by *Mr. Cartledge*,

"That Wm. Field, jun., Esq., take the Chair."—Carried.

The minutes of the preceding meeting were read and confirmed.

The election of a President was then proceeded with.

It was moved by *Mr. Cartledge*, and seconded by *Mr. J. C. Broad*—

"That Mr. Wm. Field, Jun., be re-elected President for the ensuing year."

It was then moved by *Professor Simonds*, and seconded by *Mr. Ernes*,

"That Mr. Thomas Greaves, of Manchester, be elected President."

On the ballot being taken there were found to be for Mr. Field, 11, and Mr. Greaves, 6.

Mr. Field was declared elected President for the ensuing year.

The President having returned thanks for the honour of his re-election,

The election of six Vice-Presidents was proceeded with. The following gentlemen were proposed—

Professor Willliams . .	by Mr. Lawson.
„ McCall . .	„ Robinson.
„ Brown . .	„ Gowing.
Mr. H. J. Cartwright . .	„ Cartledge.
„ W. J. Goodwin . .	„ Coates.
„ W. Thacker . . .	„ Harrison.
„ Josh. Woodger, Jun. . .	„ Wilkinson.
„ Jas. Cowie . .	Ast. Prof. Pritchard.

The ballot having been taken, it was found that there were for

Professor Williams	17
Mr. J. W. Cartwright	17

Professor Brown	16
„ McCall	16
Mr. W. Thacker	13
„ W. J. Goodwin	11
„ Josh. Woodger, Sen.	10
„ Jas. Cowie.	5

The election was declared to have fallen upon Professors Williams, Brown, and M'Call; and Messrs. Cartwright, Thacker, and Goodwin.

The election of a Secretary was then proceeded with.

It was proposed by *Mr. Harpley*, and seconded by *Mr. Gowing*,

"That Mr. Coates be re-elected Secretary."

On the ballot being taken, Mr. Coates was declared to be unanimously elected.

By order of the Council,

WM. HENRY COATES,

Secretary.

NEW MEMBERS OF THE PROFESSION.

SINCE the publication of our last number, the following gentlemen—students of the Royal Veterinary College—have passed their examination, and been admitted members of the Royal College of Veterinary Surgeons:

April 27th.

Mr. Percival Smith	Winterton, Lincolnshire.
„ Benjamin Freer	Uppingham, Rutland.
„ Samuel Henry Ellis	Hatfield-Peverell, Essex.
„ Edward Morris Davies	Ruabon, Wales.
„ James Martin Fagan	Ormskirk, Lancashire.
„ Thomas Salusbury Price	Kennington Cross.
„ Henry William Stevens	London.
„ James Thomas Handy	Marshfield, Gloucestershire.
„ William Boyce Barrow	Newmarket.

April 28th.

Mr. Daniel George Hunting	Halvergate, Norfolk.
„ Walter Brown Coe	Bury St. Edmunds, Suffolk.
„ Alfred Broad	London.
„ Frederick Keal	Boston, Lincolnshire.
„ John Doris	Cookstown, Co. Tyrone.
„ William Hamley	Truro, Cornwall.
„ James Henry Lemon	Clontarf, Co. Dublin.
„ Robert Beart	Raynham, Norfolk.

April 29th.

Mr.	William Elliott Harrison . .	Thirsk, Yorkshire.
„	George Wyer	Folkingham, Lincolnshire.
„	Edward Marshall Jones .	Ludlow, Shropshire.
„	Herbert John Hinckley . .	Radborne, Derbyshire.
„	Frederick Watkins . .	Revesby, Lincolnshire.
„	William Garratt . . .	Northampton.
„	John S. Forbes McDonald .	Fraserburgh, Scotland.
„	John Cornelius Dwyer, M.R.C.S.	Plumstead, Kent.
„	Rodney Strutt . . .	Great Waldingfield, Suffolk.
„	Griffith Thomas . . .	Aberayron, Cardiganshire.
„	John Edmund Bettison . .	Newbury, Berks.

In addition to the above, three students of the Albert College have been admitted members of the body corporate, viz. :

May 1st.

Mr.	George Durrant . . .	Hampstead, London.
„	George Hardie . . .	Swinton, Berwickshire.
„	Charles Lee Cartwright . .	Whitchurch, Salop.

MISCELLANEA.

ANCIENT REPRESENTATION OF HORSE-SHOEING.

While the restorations in Highworth Church, Wilts, were going on, a curious distemper-painting of St. Dunstan shoeing a horse, which places its foot on the anvil, was found.

DIFFERENCE OF OPINION.

I could never divide myself from any man upon the difference of opinion, or be angry with his judgment for not agreeing with that from which within a few days I might dissent myself.—*Sir Thomas Browne.*

OBITUARY—ERRATA.

We very much regret that, by a misunderstanding on the part of our informant, the death of Mr. John Anderson, of the Royal Artillery, was recorded in our last number, in the place of Mr. Hugh Anderson, of the 19th Hussars.

We have also to call attention to a typographical error which occurred in our obituary notice of the late Professor Morton. In alluding to his writings, in line 16, p. 276, by the slipof a letter, while the sheet was being struck off, "them an" was made to read "the man." Our readers will oblige us by correcting this error in their copies.

THE

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Communications and Cases.

THE MICROSCOPE IN VETERINARY MEDICINE.

By Professor Brown.

(*Continued from* p. 342.)

Examination of Morbid Deposits.—Scrofula.

It is generally accepted as the result of observation, that in disease no new elements are developed. Normal elements of tissue may be produced in excess, or they may be deficient. Certain disturbing influences may cause an arrest of development, or the growth of a structure may be accelerated; finally, a normally-formed tissue may be displaced. Under all these conditions the influence on disturbing agency is abnormal in its action, and the results are consequently different from those which follow from the action of the ordinary or normal stimuli operating during a healthy state of the organism. Among the numerous problems which arise out of the action of morbific agencies, the most prominent one that presents itself to our notice in relation to morbid deposits refers to the exact relation which those products hold to the abnormal conditions under which they occur. The universal tendency is to appreciate results and ignore causes; for example, in the disease called pleuro-pneumonia of cattle, the apparent and appreciable abnormality exists in the lungs which have undergone a peculiar alteration of structure; the soft, elastic, expansible tissue

has become converted into a firm, dense mass, which is quite incapable of carrying on the respiratory function; and without hesitation we designate this unnatural condition of the organs disease of the lungs, and the mere recognition of the morbid state is in most instances finally satisfactory. The cause of death is evident, and the inquiry is at an end. Many instances of a like kind might be adduced in illustration of the tendency to accept what is perfectly obvious in an abnormal state of a part as a solution of a previously existing mystery. A horse, for instance, may be in an anæmiated condition, and after a time may die from exhaustion. Upon a *post-mortem* examination the lungs and spleen, probably the liver and other parts, are found to be filled with a yellow, brain-like deposit, which the microscope shows to be mainly cellular in structure. A further search leads to the discovery, in some part of the organism, of a large tumour, or mass of a similar structure, and the pathologist is at once content to assert that the debility from which the animal suffered, and in consequence of which he ultimately died, was due to secondary cancerous deposit. In these and like instances an important question appears to be ignored. What is the primary and actual abnormality of the organism? Is the deposit which is apparent the essential disease, or is it the inevitable and natural result of certain changes of nutrition?

The question is not difficult to answer. No doubt can exist in the mind of a scientific pathologist that the actual change of structure, the deposition of material which does not belong to the part, or only exists in it to a limited extent, is a result of the action of some unusual influence. And thus the real abnormality relates to the condition of the organism which makes the deposit possible, and not to the deposit which is the necessary result of the altered condition of the organism. Deposition of new vital material to supply the place of exhausted tissue is admitted to be a normal process, but the mere alteration of the relation which the new matter should bear to the waste of structure at once disturbs the balance, and to the results of this derangement, not to the derangement itself, the term morbid is usually applied. In this way the affection which was described in the last article under the term scrofula, and also tubercle, typhoid matter, and cancer, are all designated diseases; and this inclusive system of classification is even carried to the extent which permits the statement that the general health is good, notwithstanding the presence of the local disease. Physiologically, such a state is impossible in the diseases to which allusion has been made. Local derangement dependent upon a special

stimulus, and amounting generally to an alteration in the circulation of the part can exist and be maintained for some time without any modification of the systemic functions, but deposits which are essentially imperfect in structure and inefficient for the reparation of the tissues are referable to depraved nutrition.

In the concluding part of the article on scrofula in the last number of the *Veterinarian* it was suggested that a general derangement of the nutritive functions would alone account for the deposition of certain materials altogether dissimilar to the tissues of the part, and evidently in a low condition of vitality, and so incapable of sustaining the functions of the part in which they are deposited. This conclusion is naturally derivable from a careful examination of the deposit. The scrofulous product and tubercle also do not contain any new forms of structure, and in both the elements are only partially developed. No perfect cells are to be found, but in place thereof particles which belong to the early condition of cells, minute bodies which are of the nature of nuclei. Instead of the process of growth being continued to completion, there does not exist sufficient vitality in the newly-deposited material to perfect the development of the tissue, which accordingly remains in an embryo condition for a certain time, and then, instead of advancing, retrogrades, and becomes mainly a mass of calcareous matter, which is not susceptible of any further progress; the only decided change which can occur is the physical one of softening from the admixture of the fluids of the part with the particles of the mass, and the conversion thereby of the solid into a fluid product. This change is quite mechanical, and no alteration is affected in the ultimate elements of the deposit.

Microscopic investigation entirely dispels the idea of there being any special elements in the deposits which are found in scrofula and tuberculosis, and also removes the mystery which at one time obscured the view of the abnormal process, proving that it is the natural consequence of diminished tone of the system induced by causes which tend to debilitate the organism. Under perfectly normal conditions, local irritation, whether confined to the lungs, liver, heart, or other organs, is followed by increased activity in the nutrition of the part, and a deposit of tissue more or less perfectly elaborated as the consequence, but when a similar local excitation of function occurs during extreme debility, the molecules of the deposited matter lack the power to form perfect tissue, and either die, or degenerate, or otherwise advance sufficiently far to

form structure of the kind, which is met with in scrofulous deposit.

It would be easy to pursue the inquiry further, but enough has been said to indicate the necessity for more comprehensive views than those generally entertained in reference to morbid products, which do not in themselves constitute the disease, but are in reality mere results of a morbid condition of the organism.

THE QUESTION OF THE DAY: WHAT KIND OF EDUCATION WILL PRODUCE THE MOST EFFICIENT VETERINARY SURGEONS?

By Mr. Thomas Greaves, M.R.C.V.S., Manchester.

The discussion of the question of education occupied much of the time of the late annual meeting of the profession. It is a question fraught with deep and lasting importance to the profession at large, and as such it cannot be too seriously considered; and if an accurate knowledge of the subject can be arrived at, not only the profession but society at large will be benefited by its being carried into practice.

The considerations I wish to bring prominently forward for discussion in this and subsequent papers, and which I hope will also provoke abler writers than myself to give their views for the purpose of clearly defining and throwing light upon this vital matter, are—

1st. Is our profession of such a nature as to require a highly scientific education of its members, in order that they may attain eminence as successful practitioners?

2ndly. Is a sound English education, coupled with the greatest amount of practical knowledge that can be given to youth, sufficient for all purposes?

3rdly. Is the time required in obtaining the higher branches of a scientific education occupied at the expense of, and to the exclusion of practical knowledge?

4thly. Does the possession of highly scientific attainments lift the mind of the possessor above the realities of his profession, and dispose him to look down upon the duties required of him as a veterinary practitioner?

I shall content myself with discussing these matters. At present, it will be observed that I only ask general questions which others can, and I hope will, answer as well as myself—answer them indeed from their own point of view, as this may

be the means of bringing out opinions which are valuable, and thus enable us to arrive at some useful conclusions.

Question 1.

I believe history abounds in every age with instances in which persons with scarcely any education have taken rank with the greatest and most useful men of the time in which they lived; but I am free to admit that this is no proof that these same individuals would not have become equally great or useful if they had possessed a high class education. I will, however, confine my remarks to our own profession, and at the outset state that in my opinion for all practical purposes it is not necessary that the veterinary surgeon should possess a highly scientific education. Upon this point I am aware that a great difference of opinion prevails in the profession. Probably many may be inclined to think that I am in favour of the other alternative, viz., of no education, since it is said of the middle course that "a little education is a dangerous thing." To such I would reply by asking, what amount of instruction is to be termed a low, and what a high education? Is it not a fact that, owing to the facilities for teaching which now exist, the ordinary or common education of to-day would have been esteemed a high-class education by our forefathers? If this be so, is it too much to suppose that what is esteemed a highly scientific education of to-day may be looked upon with contempt in the next generation?

I am a full believer in education and in the vast advantages accruing from it. It greatly increases a man's intelligence and capacity, but it can never be a substitute for natural ability. I am also in favour of a man being well educated in those branches that have a direct bearing upon his calling, and of his employing his whole life, concentrating as much as possible his ability upon the particular calling he is engaged in, for by these means he is most likely to improve and perfect himself in that calling. I would give him every possible advantage from his earliest years of acquiring knowledge, and becoming familiarised with the duties of his future occupation. No time is so favorable for receiving lasting impressings, for moulding the mind or for training the hands for any calling or occupation, as that of youth.

I think it is a fatal mistake to send a boy to school, or it may be to Oxford or Cambridge, and keep him there until he is of an age fitting him to go to the Veterinary College, and attend his two sessional courses of lectures. It is true that he may pass a very creditable examination, and obtain

his diploma—which specifies that he is competent to practise the veterinary art—and still lack those special requirements which are needed by a veterinary surgeon. It is quite possible that a young man may have had a first-class scholastic education, either in England or on the Continent, that he may have distinguished himself at school, gained high honours, have passed a most satisfactory preliminary examination at the Veterinary College, have attended most punctually all the lectures, been most assiduous and industrious in the dissecting-room, paid the greatest attention to all his studies, including the hospital practice (which practice, however, imparts such a modicum of experience, that each professor admits it to be totally inadequate for obtaining practical knowledge), be possessed of great ability, and yet be deficient in that practical business knowledge, that correctness of discernment which alone will enable him, when left to himself, to recognise disease, and at once to accurately determine its nature, and treat it successfully.

I am strongly disposed to believe that the tendency of such an education as I have sketched is to alter the tastes, and change the tone of the mind and inclination of its possessor, and to render him less disposed to plod and work, or to enter heartily into the details of his occupation. It is quite true his mind is enlarged and expanded, but at the same time it has become so refined and susceptible as to view many things as irksome and obnoxious; in fine, to despise labour as degrading to one so well educated as himself. It will, I think, be admitted that there is a great proneness in the mind of such a man to view every case of disease, whether it be one of lameness or of sickness, with too much science. He is apt to contemplate the disease from a standpoint which leads him into such minuteness. He will ponder over the disease with a mind which brings the microscope to bear upon it, however simple it may be. The reality of our being fearfully and wonderfully made is ever present with him. He brings his scientific remedies to a test, and if they do not soon produce definite effects, he is apt to waver in his purposes, and even to lose confidence in his own reasoning.

Highly-educated individuals are often the victims of scientific perplexities which practical men do not experience. Such persons frequently hesitate in the choice of a mode of treatment. As time passes on, and the patient becomes evidently worse and worse, they feel deeply humiliated; failure is more acutely felt by them than by others less educated and refined; their science has been weighed in the balance

and found wanting. The education they have received tends, indeed, rather to mystify than to simplify the problems they are required to solve. Studies intricate in their nature are ever leading them into excesses, and tempting them to arouse the antagonism of Dame Nature by an interference with her delicate and complex functions, and to thwarting and foiling their success. Such veterinary surgeons may be acknowledged by all as highly intellectual men, fit associates for gentlemen; but whatever other effects such an education produces upon the mind, it generally renders it more susceptible and sensitive to failure, and unfits it to bear the hardships which the veterinary practitioner has occasionally to endure. Although his heart and soul may be in his profession, his want of practical knowledge, like an incubus, throws its shadow over the fairest prospects, and he seldom weathers the storm. After a few months, it may be years, of sore trial in the profession, in which he has been so frequently doomed to disappointment, he gives it up in disgust, and betakes himself to some other more genial occupation.

I believe it will be conceded that our calling demands a strong and robust intellect to meet the peculiar and varied requirements of its practice, to endure its fatigues and laborious duties, and to accurately diagnose disease, and successfully treat our patients. Everything depends upon the accuracy and soundness of the practitioner's observations and conclusions; no assistance can be obtained, as in our sister profession, from our patients. To perform these duties, our brain must not have been weakened by undue and severe tension when too young.

A nervous system early overdriven, a mental constitution from which the elasticity has been taken by too hard work gone through too soon, may be compared to a young horse who has been put through too much hard work at two or three years old, and become stale and worn out by eight years old. In both cases the best energies have been mortgaged, and in future years the reckless expenditure of the past has to be compensated for. The individual in such a position is wholly unfit to undertake and follow out the labours and duties of a veterinary surgeon. It follows from these premises that to attain eminence as a successful practitioner the veterinary student must be taught, not only the science, but the business, of his profession. He must be taught not only how to diagnose disease correctly, and treat it successfully, but also to know how to make his practice pay, and how to keep his customers. These are subjects which a highly scientific education does not inculcate; but a know-

ledge of them is none the less important to the veterinary practitioner.

There is much hard work in our calling, some of it might even be called dirty work. To make it answer a man's purpose he must make long hours, and every hour must be telling in his daybook. Every step he takes and every horse he touches must be adding grist to the mill. It is by a multiplicity of trifling sums that a living has to be got or a fortune to be made. A process like this is often too fatiguing and too slow to the man of refined taste.

"Some place their bliss in actions, some in ease,
Those call it pleasure, and contentment these."

(*To be continued.*)

NOTES ON THE INFLUENCE OF ATMOSPHERIC PRESSURE AND ALTITUDE ON HEALTH AND DISEASE IN MAN AND THE LOWER ANIMALS.

By G. Fleming, F.R.G.S., &c., Royal Engineers.

(*Continued from p.* 366.)

Poeppig,* who visited Peru about forty years ago, relates:—"Those who have but recently arrived at the Cerro de Pasco, encounter many difficulties, for scarcely have they made some steps on a smooth road, than they experience an inexplicable sense of fatigue, and in addition to this, when ascending the escarped streets, there is a painful difficulty in respiring, slight headache, and even congestion of blood towards the chest: certain signs that one is no more exempt from the attacks of the puna than any other stranger. If the puna (which is also named veta, soroche, and mareo) is present in the mildest form, it is manifested by a difficulty in breathing; so that in walking one is forced to halt nearly every ten paces, and attempts are vain to fill the lungs with the vivifying element by deep inspirations and extreme dilatation of the chest; the latter feels as if empty, and the difficulty, added to the futility, of all the efforts to overcome the feebleness present, is so great that the limbs can scarcely bear the weight of the body, the knees bend, and every opportunity of resting, if ever for so short a period, is eagerly accepted. The ascent by a sloping road causes the greatest trouble, and the embarrassment is only lessened by a state of the most

* 'Reise in Chile, Peru, und auf dem Amazonenstrome.' Leipzic, 1835, vol. ii, p. 84.

complete repose. Convinced of the inevitable presence of the malady, incapable of doing what one desires, and regretting the loss of valuable time, the strongest man becomes as feeble as an infant. Should the disease assume a more intense form, fainting often occurs, the blood flies to the head and the lungs, and causes an inexpressible condition of distress, and without any fever heat being present, often even with the sensation of internal cold, and anæsthesia of the hands and feet, the pulse beats 108 to 120 times in the minute. The sense of fatigue and somnolescence do not lead to sleep; on the contrary, the hours spent awake at night cause the most cruel agony, for the horizontal position cannot be maintained for any length of time, and the solace of a fire is sought for in the chimney-corner, but there one can only find an air filled with charcoal vapours; the eyes are so sensitive that reading cannot be pursued for long; some have slight pains in the head; others have an inclination to vomit and feel as if sea-sick. If this terrible condition becomes exaggerated, very distressing and critical phenomena are frequently developed. In general, those who have a strong chest and a good constitution recover in six or seven days, but weeks may pass before the health is entirely re-established. Sometimes urticaria manifests itself in different parts of the body, or an exanthem appears about the lips, which gives place to scabs and sores that bleed and cause much pain in talking. If any one who suffers from the puno (*aparamado*), in passing the Jalcas, has been attacked with the so-called chuno, he may be sure that all the abrasions or cracks in the skin will be all the more painful, and that a desquamation as hideous as uncomfortable of the skin of the face and hands is inevitable. Notwithstanding all this, however, there is no example of any individual otherwise healthy succumbing to the disease; it is only those who suffer from their chests, and particularly from organic affections of the heart, who are in serious danger. All are troubled with palpitation of the heart, but they rarely become insupportable; and the most developed form of the malady, accompanied by spitting of blood, nervous irritation, delirium, etc., is happily very rare. . . . . It is exceptional that any one is affected a second time, but the fatigue and the difficulty in breathing continues for a long period. . . . With few exceptions, all animals born in other countries and brought to this, suffer as much as mankind. Every mule, no matter how accustomed it may have been to the Andes, if it has not been for months kept on the Jalcas, commences to go at a slower pace, and exhibits increasing debility as it

approaches the Cerro de Pasco. Those which are strangers require particular attention, and their loads must be diminished, for the puna attacks them under the form of sudden death, and not as a chronic disease; they stop, fall to the ground, and can only be saved by affusions of cold water, bleeding, and friction with garlic. Such animals are of no use for a long time, and it is necessary to send them to low-lying pastures to recover. Dogs show no trace of this disease (?). This animal, however, cannot withstand the climate. Cats are rare on the Cerro, and on all the Jalcas of the same height; I was told that they always bring them from great distances, and that youngs one are very difficult to rear. With poultry the women have much trouble, for hens either do not lay, or they cannot be made to hatch carried eggs; the chickens brought from the valleys do not live for any time, and they have to be treated as if newly hatched, and as if they were rare birds. The cuyes* and rabbits withstand the climate, but they lose much of their fecundity, elsewhere so wonderful."

Humboldt noticed this effect of altitude on poultry. "It is a very curious physiological phenomenon, that on the plateau of the city of Cuzco, which is more elevated and cold than that of Mexico, poultry have not begun to be acclimatised or to breed after thirty years' trial. Until this time all the fowls perish in the process of hatching."†

A somewhat analogous circumstance has been remarked with regard to the human species in Mexico and Peru. In 1856, it was reported that the mulatto had nearly disappeared from the city of Mexico, and that very few negroes were to be met with; that this was owing in a great measure to the rarefied state of the air of the elevated tablelands of that country, where there was but little perspiratory work for the skin, and which was consequently unsuited to the negro. Dr. Nott says that, like the quadrumana of the tropics, the negro is killed by cold, and is peculiarly liable to consumption beyond the tropics.

It has been stated that in the *Tierra fria* and the *Tierra caliente* there is a preponderance of males in the human species, but in the Templada, or temperate region, an excess of females. I am not aware whether this is due to the climate, or whether the same disparity in the sexes may have been observed in the lower animals. It may be noted, however, that when the mines of Potosi, and others in that

* Cuyes, a species of wild rabbit or guinea pig (*Cavia Cuttleri*, King), called by the natives of Peru "*Cui del Montes.*"

† 'Essai Politique sur la Royaume de la Nouvella Espagne,' vol. i, p. 69.

very elevated region of Upper Peru (12,000 to 14,000 feet above the sea), were worked by European Spaniards, it was no uncommon occurrence for them to have their wives conveyed to the coast during the latter months of pregnancy, and where they remained until some time after giving birth; for it was found that this removal was almost, if not urgently, necessary to ensure parturition.

When travelling across the Llanos del Pao, or eastern part of the plains of Venezuela, Humboldt made the following remarks with regard to sheep:—"We beheld everywhere the same objects; small huts constructed of reeds, and roofed with leather; men on horseback armed with lances, guarding the herds; herds of cattle half wild, remarkable for their uniform colour, and disputing the pasturage with horses and mules. No sheep or goats are found on these immense plains. Sheep do not thrive well in equinoctial America, except on tablelands above a thousand toises high, where their fleece is long and sometimes very fine. In the burning climate of the plains, where the wolves give place to jaguars, these small ruminating animals, destitute of means of defence, and slow in their movements, cannot be preserved in any considerable numbers."

On the 16th December, 1831, M. Boussingault, accompanied by Colonel Hall, made an attempt to gain the summit of Chimborazo by starting from Mocha, Chilapulla, and Arenal. The former gentleman reports that they were compelled to stop when they had got to 6004 metres elevation. The barometer then only marked 0·35, and the temperature was 7·8 (Réaumer?) above zero. The effects of the rarified air were only experienced by them in a moderate degree. "Three quarters of an hour after our arrival at this height," says M. Boussingault, "the pulse of my guide, as well as that of Colonel Hall, was only 106 beats in a minute; we were thirsty, and evidently suffering from a slight febrile disturbance, but not to a painful degree. . . . . We had, it is true, experienced a difficulty in breathing, and an extreme sense of lassitude while we ascended, but these inconveniences ceased with rest. After a brief repose, we believed ourselves to be in a normal condition again. Perhaps our insensibility to the effects of the rarified air ought to be attributed to our prolonged residence in the elevated towns in the Andes. When one has testified to the bustle going on in such towns as Bogota, Micaipampa, Potosi, &c., which are situated at from 2600 to 4000 metres' elevation; when one has been witness to the strength and the prodigious agility of the toréadors of the bull-fights at Quito, standing at 3000 metres;

when one has seen young and delicate women give themselves up to dancing for entire nights in localities nearly as high as Mont Blanc, where the celebrated Saussure found it so difficult to summon strength enough to consult his instruments, and his vigorous mountaineers fell exhausted when crossing a cavity in the snow; and if I add that a celebrated battle, that of Pichincha, was fought at an altitude little less than that of Monte Rosa (4736 metres), it may be accorded, I think, that man may become accustomed to respire the rarefied air of the highest mountains. In all the excursions I have undertaken in the Cordilleras, I have always experienced, at an equal height, a sensation infinitely more distressing in climbing an acclivity covered with snow than in ascending a bare rock. We have suffered more in scaling Cotopaxi than in mounting Chimborazo. On the former we had constantly to rest on the snow. The Indians of Antisana assured us that every time they travel for a long period on a snowy plain, they feel suffocated (*ahogo*), and in carefully considering the inconveniences to which Saussure and his guides were exposed in bivouacing on Mont Blanc, at the simple height of 3888 metres, I am disposed to attribute them, at least in part, to the unknown action of the snow. This bivouac, in fact, did not take place even at the elevation of the towns of Calamarca and Potosi. The sense of suffocation which I have experienced many times when climbing on snow, and when the sun's rays fell upon it, has made me suppose that it may have disengaged, by the action of heat, a sensibly vitiated atmosphere. What confirms me in this singular idea is an old experiment of Saussure's, by which he believed he had ascertained that the air disengorged from the force of the snow contained less oxygen than the atmosphere. The air examined by him had been collected in the interstices of the snow on the Col du Géant."*

Dr. Smith's testimony† with regard to the climate of Peru is valuable as corroborating the accounts of other authors. When travelling across the mountain chain of this country, he was a witness to the curious symptoms induced by the ascent: "We had not left Casacancha far behind, when one of our fellow-travellers experienced the most distressing headache; his face became turgid, the temporal arteries throbbed with violence, the respiration was difficult, and it seemed to him as if the chest was too narrow for its contents. The other gentleman complained less; it was only a vexatious headache that disturbed him, but his eyes were

* 'Mélanges de Géologie,' vol. i, p. 185.

† 'Peru as it is.' London, 1835.

bloodshot. The writer was still differently affected from either of his fellow-travellers. His headache was moderate; but his extremities soon became quite cold as the sun declined; the skin shrank, and then came on a sense of sickness and oppression about the stomach and heart, with a short, hurried, and panting respiration."* After remarking on the probable causes of this condition, he alludes to the effects of the diminished aërial pressure on the cattle which are made to climb those regions, and says: "Before the arriero attempts to ascend the Cordillera, he anoints, as we have seen him do, his cattle over the eyes and on the forehead with an unguent made of tallow, garlic, and wild marjoram, as a preventive against what he calls the "veta;" attributing the effects of atmospherical rarefaction to a subterraneous *veta*, or vein of a noxious ore or metal, which, he believes, diffuses in the air of the cold summits and heights its mephitic and poisonous particles."†

After telling us that the llama delights most in the cool regions of the mountains, and cannot withstand the damp heat and denser air of the coast, he mentions the effects of the change on other creatures: "In travelling from the inland country to Lima, we have had occasion to observe that when the horse, reared on the cold tablelands, and not accustomed to any warmer climate, was taken from the Sierra to the coast in the hot months, he pined away almost as fast as a common fowl on the high seas when confined in a coop, and exposed to the spray in rough weather. But the pony, thus affected by the climate of the coast, will, with surprising readiness, recover his spirits and health as he returns and ascends the tortuous and shelving paths that lead to his native element near the glacial peaks of the Cordillera."‡

At Lima, on the coast, he observes: "There appears to be something peculiarly enervating and degenerating, aggravated by the total neglect of sanitary police, in the state of the atmosphere and locality of Lima. This effect is observable in the dog species, which becomes sluggish and spiritless, and more disposed to bark than to bite; but it shows itself more especially in the male descendants of unmixed European parentage."§

In another place, when speaking of the influence of altitude, he asserts that "cattle that feed near the snow line, where the pasture is very fattening, are, when in high condition, very prone to sudden death, and the natives attribute

* Vol. i, p. 272.
† Vol. i, p. 274.
‡ Vol. ii, p. 247.
§ Vol. i, p. 16.

the event to the too full state of the blood-vessels in the animals cut off in this manner. I recollect that in Cerro Pasco a fine bull-terrier belonging to one of the Cornish miners fell down dead, probably from apoplexy, when in the act of fondly jumping up, in acknowledgment of the caresses of his master or some of his friends."*

Unanue,† a native of Peru, and a man of science, has made more extended inquiry, perhaps, than Dr. Smith. Speaking of the dogs peculiar to the highlands, he adds: "The pacos and alcos inhabit the Sierra. Such of them as are domesticated descend with their masters to the coast, where they stay but a short time, and then return, for in the heat of the coast they soon fall victims to the *caracha*,‡ or itch—the consequence of increased excitement and circulation on the surface of the body, and a want of perspiration occasioned by the thickness of the skin. . . . Should we compare the dogs reared in this city (Lima) with those allowed equal freedom in the cities of Upper Peru, it will be found that the former are most indolent and indifferent to everything, so that any one, though an entire stranger, may step over them without the least molestation; but the latter surly curs it is necessary to approach with caution, because they attack all persons with whom they are not well acquainted and on friendly terms. These animals are subject, especially in spring, to catarrhal epidemics which are peculiar to themselves; and they are also liable to influenzas by which mankind are affected."

With regard to the bovine and some other species of the domestic animals, he adds: "The black cattle of the Sierra do not endure the climate of the coast; immediately they descend from their native mountains, to use the vulgar expression, they become *touched;* that is, they become stupefied, and die with amazing rapidity. On examining the entrails of cattle thus cut off, the liver, which has a broiled appearance, is observed to be indurated." "I conceive that these animals are affected by transition of climate in the same manner as the human species—for, as soon as bullocks from

* 'Edinburgh Med. and Surgical Journal,' vol. lviii, p. 357.

† 'Observaciones Sobre el Clima de Lima.' Madrid, 1815.

‡ Scabies, called *kra-kra* on the Gold Coast, West Africa, is a common disease there, and is very communicable.—*Clark*, 'Topography and Diseases of the Gold Coast.'

It is somewhat strange that the Spaniards should have introduced this word into the settlements on the West Coast of Africa. The disease would appear, however, to have another designation in Peru, the term 'sarna' being the one by which it is indicated in the *Times* city article for August 20th, 1867, where it is described as a pustular and highly contagious malady, and one very destructive to the flocks of alpacas.

the high and cold regions of the Andes arrive on the warm coast, the circulation of their blood is unusually accelerated and directed to the surface; but, as the skin which covers them is too thick and unyielding to allow of proper transpiration, the consequence is that there arises an ardent fever which destroys them. In beeves this fever is more violent and burning than it is in the paco or alco (native dog), because the skin of the latter, being of thinner texture than that of oxen, offers less resistance to the outlet of the humours; so that in the animals of finer skin there comes out a salutary eruption which saves them; while in black cattle nothing of this sort occurs, and therefore they perish with incredible celerity. The butchers have not yet found out a remedy for this disorder. They only know from experience that the mortality among cattle is greater in summer than in winter: a fact confirmatory of our conjectures as to the nature of the distemper, and therefore it is during the winter, or misty season on the coast, that cattle are driven down from the mountains to supply the Lima market."

"The sheep transported from Europe have increased to an amazing degree on the great commons or pastures of *ichu* which abound on the heights of the Andes, and in the wide-spreading provinces of Collao the quality of the wool is particularly superior. As these pasture grounds are found at twelve or fourteen thousand feet above the level of the sea, they do not admit of the cultivation and population of the lofty plains of Anahuac or Mexico, which are only six or eight thousand feet above the ocean.

"In the high and Cordillera ranges, horses, asses, and black cattle are, like men, of small size, because their growth is stinted by cold—they are covered with hair, which has the softness, length, and consistence of wool, by means of which Nature protects them against the inclemency of those bleak and frozen wastes, even as she does the flowers of such shrubs as grow on the same frigid heights. The shrubs which grow at the altitude of from twelve to fifteen thousand feet above the Pacific, are of a woody fibre, resinous, and covered with firm bark, to enable them to resist the effects of the piercing cold to which they are naturally exposed.

"On the other hand, in the valleys and on the coast, where the heat is sufficient to enable the various members to develop themselves freely, those very quadrupeds are of good size, spirited, and showy. The donkey is strong, and in Lima the most serviceable of the domestic animals; as he is also at the sugar works, where he carries on his back a great weight of cane from the field to the mill; the horse is

graceful and spirited, the bulls are powerful, and in the valleys of Chincha and Cañete, where a certain wild breed are carefully reared for the bull-ring, these animals are most ferocious."

Mr. Hill,* when travelling across the mighty chain of the Andes, makes the following pertinent remarks: "We had not proceeded far, before we were joined by the party we had travelled with on the previous day, when we were surprised to find the two children in close masks. I have not yet mentioned the necessity which the traveller is under in the Andes of covering the greater part of the face during the day, which would otherwise suffer so much from the reflection of the sun's rays from the ground, as to cause very great inconvenience, if not permanent injury. Our method was to tie a scarf round the lower part of the face, which was at least sufficient to prevent any serious mischief; but the father of these two children wore a veil himself, and had his children's faces protected by complete masks.

"All the party seemed in very good spirits, until we came to the highest part of the next Cordillera, after about four hours' march, when suddenly one of the children was taken with what is here called *sorrochi*, which is involuntary vomiting, the consequences of which are frequently fatal in the Sierra. The father was much alarmed, and we stopped and descended from our mules, to aid him in anything that could be done. But while we were considering the best means of relieving the suffering of this child, who was lying in her parent's arms, the other fell into the same distressing state; and they both continued retching for about half an hour. They were, however, healthy strong girls, and the confidence their father had had in them seemed to be well founded: for they now quite revived, and expressing their wishes to proceed on their journey, the caravan again moved on.

"I shall take the opportunity to make a few more remarks, which will accord with what I afterwards learned concerning the effects of the rarefied atmosphere upon persons who, for the first time, respire on elevated regions. They are not always, indeed, precisely the same; but there can be no doubt of their arising in every case from the same cause—the diminished pressure of the atmosphere—and that the various forms they assume proceed wholly from the difference in the state of the health, and in the character of the constitutions of the parties attacked. The inconvenience suffered by my companion and myself during our travels was

* S. S. Hill, 'Travels in Peru and Mexico,' vol. i, p. 159—163.

that most commonly experienced, and was merely weariness and difficult respiration, with a sense of pressure upon the chest, especially during the night, sometimes accompanied by starting and broken sleep.

"It is seldom, indeed, that anything more severe than that which has been mentioned has been experienced at a lower elevation than about 12,000 feet above the level of the sea, which we had probably at this time hardly attained. The malady, however, in its severe form, is accompanied by symptoms of the most distressing kind, and is generally fatal.

"If the traveller happen to be of a plethoric habit of body, the disease is likely to be most severe. It is then commonly attended with vertigo, dimness of sight, difficulty of hearing, and often a flow of blood from the eyes and nose, and sometimes even from the lips, and violent pains in the head, and vomiting. But with travellers of a spare habit of body and not very strong, it is more likely to cause fainting fits accompanied with spitting of blood. With persons, however, in good health, the symptoms are rarely more than vomiting, and more frequently they are confined to weariness and difficult respiration, such as I have mentioned both my companion and myself experienced.

"As it has been observed that the disease is more prevalent in the districts where the metals most abound, there is an impression among the inhabitants that it arises from, or is greatly exaggerated by, the metallic exhalations which are supposed to fill the atmosphere of these regions. This has doubtless, however, arisen from the disease prevailing most among those who come in search of metals, which may be accounted for by the fact that they are generally persons unaccustomed to the atmosphere of the mountains, and the most exposed of any to fatigue. There can be little doubt, indeed, of its proceeding in every form in which it appears, entirely from the diminished pressure of the atmosphere, the effects of which every one experiences in one way or another upon attaining any considerable elevation. These effects of the rarefied atmosphere are not confined to the human species. They are, indeed, equally, and, in some instances, even more felt by the lower animals of the creation than by ourselves. The horses and mules of the plains cannot for some time travel the same distances in the mountains in a given time, as they can in the plains, nor bear the same burdens in the sierra which they are accustomed to bear in their own climes. When, however, they are brought from the lower country to the higher, and have great care taken

of them, they generally, after a few months, become acclimatised, and perform nearly the same labour as those bred in the elevated regions.

"If it should cause surprise that these effects of the rarefied air are so much more remarkable here than any experienced in Europe, it must be remembered that during the journey which I am about to narrate, we have to pass over heights four or five thousand feet above the peak of Mont Blanc, and that, too, in the torrid zone. One, indeed, of the cities we shall by and by visit is situated at about the same height as the summit of that mountain.

"It is probable that Cuzco is not very healthy for persons with delicate chests, and born in low countries. If the mountain air is pure, it is also highly rarefied, and enough has already been said of the necessity of powerful lungs to consume enough for the ordinary purpose of life. Doctor Bennett informed me that he had examined the lungs of Indians of the Sierra after decease, and had found them of considerably greater volume than those of the people of the lower country. All the living creatures of the inferior species, it is also well to know, are furnished with larger and more powerful pulmonary organs in the mountains than in the plains."*

To the late French expedition to Mexico we owe an excellent account of the influence of altitude in that country, from the pen of a distinguished army veterinary surgeon, M. Liguistin. It is scarcely necessary to say that, with regard to the lower animals, only those who have studied them in health and disease, and have scientifically and systematically investigated the action upon them of external agencies, are those on whom the greatest reliance can be placed for accurate and satisfactory descriptions, and it is to them that we must look for the materials required to complete a really scientific and comprehensive treatise on medical geography which will be of utility to the physician and veterinary surgeon. I would with pleasure refer the English veterinarian to the excellent 'Études sur le Mexique' by this gentleman, containing, as they do, a most elaborate and complete veterinary medical history of that interesting country, such as has been seldom attempted. I can only now refer to those portions of the description most pertinent to the subject of our inquiry, a matter of regret, because of the interest and importance which attaches to the other sections.† In his general considerations, he says: "An in-

* Op. cit., vol. i, p. 258.

† This highly creditable contribution to comparative pathology will be

teresting study is that of the repartition of diseases in a veterinary point of view, in the different regions of a country. To trace a *tableau* of the reigning or dominant maladies, on all the points of this territory, is a complicated task, demanding the concurrence of a large number of observers placed in situations a wide distance apart, and who could furnish each his contingent of information. From the collection and combination of these reports would result a work to which I can only now furnish some elements. What are the influences of the different climates of Mexico on the larger species of animals which people this vast country? To what diseases are they most exposed? On what conditions do they become affected? What is the relative frequency of glanders and farcy, of pleuro-pneumonia, and of anthrax (*Charbon*)? Is rabies easily developed in some animals, but particularly the dog? What is the proportional mortality amongst the various domestic creatures inhabiting this immense region? Such are the questions most worthy of fixing our attention.

"The causes of disease exist everywhere; this is a fundamental, incontestable truth. But in tropical countries, there can scarcely be any doubt as to the climate constituting the principal element in pathology. To justly estimate the soundness of this proposition, it is necessary for our present purpose to divide Mexico into three horizontal zones, according to popnlar custom and observation—hot region, temperate region, and cold region. The first corresponds to a distance extending from the sea-level to a height of 1000 metres,* and a width of 25 to 30 leagues. The second comprehends the next 1000 metres, and a kilometrical distance nearly equivalent to the preceding. The third includes the country exceeding 2000 metres in elevation. Add 2000 metres and you arrive at the regions of eternal snow. This division of Mexico into low country, middle region, and plateaux, responds perfectly to the study of the veterinary medical constitution prevailing in the land. Everywhere in these three classical zones, considerable quantities of animals live on the surface of the ground; but the proportion varies according to the altitudes. Thus it is that the density of the animal population becomes increased as we ascend towards the north, while the mortality is heightened in descending towards the coast, although in the three regions there are numerous examples of longevity. Indeed, if it be true that

found in the 'Journal de Médecine Vétérinaire Militaire' for the years 1865-66-67.

* The metre is about one yard three inches.

the resemblance and the analogy between the diverse species of a country are incontestable, it is not less correct to say that this resemblance and this analogy are not absolute; and no one can ignore the fact that, under the influence of climate, particular modifications take place which adapt species to the different local conditions in the midst of which they are placed. And these modifications are so sensible that they produce alterations in the constitution and temperament of animals to such a degree as to enable them to support without inconvenience, influences which would be prejudicial and even deadly for others. This is why diseases, to all appearance very serious, attacking acclimated animals, are neither so redoubtable or pernicious in their effects as these same maladies attacking creatures accidentally imported into a new latitude or foreign climate.

"As a consequence, the four following propositions may be set down as the expression of the generality of facts:—1. An animal which lives in a country is physically adapted to exist conveniently in that country. 2. Its external structure is adapted to the exigencies of the climate it inhabits. 3. Its constitution, its temperament, and the idiosyncrasy which characterises it, are equally in harmony with the medium in which it is placed. 4. The maladies to which it is predisposed are the consequence of special influences inherent in the climate in which it dwells; their characters and gravity are always modified by these same causes.

". . . . We will then successively study the development of the maladies, according to the altitudes;—the endemic, epizootic, and the contagious dieases.

Torrid zone.—This region extends from 0 to 1000 metres' elevation. On leaving Vera Cruz, we enter a region of plains about 25 leagues in extent; then comes the first barrier of the Cordilleras, which we ascend as far as the Chiquihuites, and reach the plain on which Cordova is situated. This region terminates, so far as we are concerned, the hot climate. We find in this space of classical ground dynamic affections. At the port of Vera Cruz we see permanent marshes; in the plain these are periodical—that is to say, the rainy season transforms more than one half of these districts into marshes which are completely dried up in winter. The range of mountains in which is the Pass of Chiquihuita, offers conditions of insalubrity due to the prevailing winds, which, blowing from the east, carry with them an immense quantity of emanations from the plain over which they pass, and deposit these largely on the first obstacle they encounter in their progress. This influence of

the prevailing winds is propagated to Cordova, and to these limits determines an identical medical constitution. The mean annual heat oscillates between 23° and 26° (Centigrade ?), and the abundant evaporation of water is the cause of the humidity which constantly reigns in the torrid zone, and of the floods of rain that invariably appear at certain times of the year.

"If we study the action of this excessive climate from a physiological point of view, we will meet with important modifications impressed upon the principal organic functions of animals endowed with particular constitutions. These modifications are the undoubted result of the action of physical agents surrounding these creatures, the most prominent of which are found in the high temperature, the deluging showers alternating with the heats, the thermometric variations between the day and night, and the influence of marshy effluvia.

"So it is that the animals inhabiting this region are particularly characterised by a very marked osseous development, flaccid muscles, the abdominal viscera enlarged, without real obesity or good condition of body, and possessing a decided physiognomy in which is betrayed the dulness and languor of life; also by the deep colour of the skin, white patches on the extremities, and most frequently leprosy about the nose, on the lips, and in the nostrils; besides these there is a factitious impressionability, and, in a word, all the attributes of a bilious temperament, accompanied by apparent nervous superexcitation. It may also be remarked that, with the animals of this country, there is an extreme activity of the pulmonary and cutaneous exhalations, which influence to a great degree those functional operations whose action is principally directed towards the nutritive faculties. In consequence of the increase in these exhalations there evidently results a languishing of organic life, considered in a general manner. There is excessive muscular debility, a tendency to atony, and a ready excitability of the nervous system, which the slightest disturbing influence is capable of bringing into play. The nervous constitution and the bilious temperament predominate in the organism. So it is that all the diseases affecting animals in this region are the direct consequence of the organic impressions which the chief organs experience under the influence of the physical and meteorological conditions of this zone. Here the mortality is great, and much more considerable than elsewhere. Nevertheless, there are found some old servants, one more proof that if the constitution has the power of resisting the destructive action of

diverse temperatures, the habit of living in these same climates may also produce the same result. Elsewhere we every day see the animals of insalubrious countries enjoy, relatively, a good state of health in their impure atmospheres, while those that are brought into them find there certain death.

(*To be continued.*)

THE PRINCIPLES OF BOTANY.

By Professor Buckman, F.L.S., F.G.S., &c.

It must now be somewhere about fifty years since Botany was made to form part of the *curriculum* of study required of the student in medicine; and it is not too much to say that the advance made in medical science during that period has been greatly aided by an extended study of the anatomy, physiology, and properties (both feeding and medicinal) of plants.

It is surely, then, time for the students, nay even the professor of veterinary science and practice, to direct their attention to a study so important; for if Botany can aid the practitioner in treating a single species of animal—man—how much more may not its help be of importance to those who have to deal with a large variety of animals of different classes and orders agreeing, indeed, only in one particular, namely, that a chief part of their sustenance, and many remedial agents which are daily used for their relief, their food and medicine, are derived from the vegetable kingdom.

But let us not be misunderstood; fifty years ago Botany was considered necessary to the medical student, only because it acquainted him with the external characters, and the names of plants used in medicine, but this is a limited view of the subject, as so well observed by Dr. Balfour.

The object of the connection between scientific and mere professional studies is here lost sight of. It ought ever to be borne in mind by the medical man that the use of the collateral sciences, as they are termed, is not only to give him a great amount of general information which will be of value to him in his after career, but to train his mind to that kind of research which is essential to the student of medicine, and to impart to it a tone and a vigour which will be of the highest moment in all his future investigations. What can be more necessary for a medical man than the power of

making accurate observations, and of forming correct distinctions and diagnosis? These are the qualities which are brought into constant exercise in the prosecution of the botanical investigations to which the student ought to turn his attention as a preliminary to the study of practical medicine. In the prosecution of his physiological researches, it is of the highest importance that the medical man should be conversant with the phenomena exhibited by plants. For no one can be reckoned a scientific physiologist who does not embrace within the range of his inquiries all classes of animated beings; and the more extended his views, the more certain and comprehensive will be his generalisations."

As a mental training, Botany cannot be greatly overrated, the observation of minute distinctions which the practised eye so soon gets accustomed to will be found of value, not merely in enabling us to classify plants, but in forming a mind trained to the due weighing of consequences, and in this light our science will be found to embrace all that is good in mathematics in enabling the student to quickly grasp points essential to the working out of many a problem in nature, and to divide, and weigh, and combine with as much logical precision as in the physical sciences themselves.

In fine, as an educational matter, we view Botany as being as essential to the veterinary surgeon as to the educated medical man. It is only learning and scientific training which has taken the practice of medicine and surgery out of the hands of the quack and the barber surgeon. The medical practitioner is now a learned man and a gentleman, the quack is rarely met with, and when so his title cleaves to him. Albeit the cow-leech is everywhere to a great extent, because the veterinary surgeon has not by so liberal an education and such comprehensive scientific training made his title good to that high position in which we hope and feel such attainments are destined to place him.

Having, then, arrived at the conclusion that at least a knowledge of the principles of Botany is even more desirable for the members of our own than of the medical profession, not only on account of its useful practical bearings, but on account of its value in an educational point of view, we intend devoting a few chapters to an examination and elucidation of the subject, in doing which it will be our endeavour to enter more or less minutely into a consideration of the following subjects:

1st. The functions of plants and the bearing which Botany has on Zoology. In order to work out this subject due care will be taken to explain, by means of woodcuts and written

descriptions, the anatomical structures of vegetable organisms. Thus, beginning with the most simple parts and forms of plants, we shall arrive at that point where Zoology ends and Botany begins, and that such a blending of the one into the other that there should be a territory where the botanist and zoologist must as yet consent to a joint occupancy, is in itself an important argument of the value of a study of one science as an illustrator of the other. But besides this, the study of the lower forms of vegetable life may be expected to produce valuable fruit in explaining certain kinds of diseased action in the lower animals as it has done in human practice. We hold, indeed, that our knowledge of the functions of the different organs of plants, the nutrition of plants themselves, is all important as bearing on the functions and nutrition of the animals destined to feed upon them; and, therefore, that animal and vegetable physiology should for all practical purposes be considered not as separate and distinct subjects but as one and indivisible.

2nd. *The principles of classification.*—This subject, rightly considered, has more to recommend it than a *memoria technica* or dry lists of classes, orders, genera, and species, or a mere knowledge of the names of plants. Correct classification must depend upon a knowledge of structure and function with other details of plant life. This attained, more follows, not the least of which is the recognition of as it were families of remedial agents, failing any member of which some near relative may be all important.

It, however, is necessary to be cautious in considering that like curative powers belong to a greater or less extent in all the members of a genus, or, indeed, of a natural order; as thus, hemlock is a poisonous plant to most animals, but parsley is a wholesome sheep food. The coniferæ are in general a harmless group, but the yew is esteemed poisonous to cattle. Grasses in general are useful cattle food, but even these in some states appear to be the parents of some serious cattle diseases, to which one may, perhaps, either wholly or partially refer splenic apoplexy, abortion, &c.

But, not to multiply examples of this kind, we shall find that a knowledge of plants at sight would at once tell us the nature and composition of herbage; such knowledge decides the value of land simply because it acquaints us with its capabilities of affording good and wholesome or innutritious or useless food for stock.

3rd. *The medicinal and dietetic properties of plants* may well afford matter of the highest importance to those who have to use them as remedial agents. Why should one

plant be a means of sustaining life, while another may cause instant death? Why should one field cause the scour in cattle, and another as suddenly alleviate the symptoms engendered by the first? Why should certain plants operate as poisons on the human family, and yet be innocuous to the lower animals? These and the like inquiries open up to us every day, and they render it of importance that the practitioner should be able to analyse a pasture and to make out its contents; or if his knowledge of the subject has not attained to this, at least education should make him alive to the importance of such inquiries, so that he may be the better able to test, examine, and marshal his evidence upon points of this description.

But, further, proper diet is now justly considered as necessary to health, and the knowledge of the nature and properties of such plants as are used for animals cannot fail to be of great service in regulating all matters relating to the economy of health and growth, as well as of feeding for the meat market. These and a thousand questions of a kindred character must constantly arise in every man's practice, the proper study of the principles of which will serve him in good stead wherever he may be, at home or abroad. We may, then, not unfairly hope that Botany will take its proper place with kindred sciences in the education of the veterinary practitioner, and at all events in forwarding its discussion and elucidation in the pages of the *Veterinarian*, we cannot but hope that we shall "have done the state some service."

THE VETERINARY BILL AND COLLEGE EDUCATION.

By John Barker, M.R.C.V.S., Scarborough.

The last number of the *Veterinarian* contains a very full account of the sayings and doings of the Council of the Royal College of Veterinary Surgeons, upon which much depends that is of vital interest to us as a body, and by which we rise or fall in the estimation of the public or our employers.

I regret to find that what we were all looking forward to as the one thing needful for elevating our social position and promoting our interests—namely, the Veterinary Medical Bill—seems completely knocked out of time. Since then our much-prized Journal has contained little else than bitter recriminations concerning the Scotch Charter, the opposition

to which I cannot see my way clear, since we all admit that our Charter is null and void for purposes of protection, both to the members of the profession and also the public at large. I think that, as in trade, a little wholesome competition is decidedly good with regard to our colleges; and if the Government be disposed to grant a charter to Scotland, let us do all in our power to get ours altered, or a good practical Bill passed that will be of some benefit to us and protect the public from quackery and humbug. To say the least, I consider that our Scotch brethren have been unfairly treated in many respects, and in my opinion great credit is due to them for the way they have roughed it. They have planted the standard of veterinary science in remote towns and districts where qualified practitioners were previously unknown, as well as done the same thing in many inland towns both in England and at home.

To draw invidious comparisons like those which emanated from Mr. Ernes, with regard to the manner of teaching in the Edinburgh school and the cheapness of the education there obtained, shows a want of knowledge of that which is required.

These remarks merited the reproof then received from various members of the Council. Many seem to think that the only way of raising our status and scientific attainments is by increasing the fees and extending the courses of lectures, but I contend that it is impossible to arrive at any good results thereby. We cannot look back without regret at the blow our profession sustained at the outset of the Cattle Plague, when the public were suddenly made aware that many, perhaps even a majority, of the profession were ill acquainted with cattle practice, and the disgust which was caused by the very same men taking fees for merely condemning diseased animals to the poleaxe.

There are now good reasons to hope that education will force its own way among all classes, and on this depends mainly our success. We must go with the times. We cannot go beyond them, nor can we force scientific ideas into the dull brains of some of our employers. Letting alone the cost of education, the after expense of establishing a practice is something considerable, and mainly because of the fear and dislike to anything new which farmers and others in country districts generally entertain. These men prefer to stick to the old school of farriers, and thus the educated veterinary surgeon is left to his chance of succeeding him should he happen to drop off, or become incapacitated to attend to his duties. Fancy the young man of the newly

talked-of system in such a fix! He is all science and theory, and burning with impatience to apply principles to practice. It is only those who have realised such a feeling that can tell of the uneasiness of their position.

PUNCTURED ABDOMEN, NECESSITATING REMOVAL OF THE OMENTUM.

By S. Shaw, Ashland, Ohio, U.S.

Some eighteen months since I was called to attend an unusual case of accident, the particulars of which I now forward for publication in the *Veterinarian*. A farmer, on taking the "work-horses" out of a field on a Sunday evening, to feed them with grain, in order to have them fit for Monday, left a colt (a year and half old) in the field, which, on running along the fence for the purpose of getting to its companions, ran over a revolving hayrake, and striking the hand-frame with his breast, overturned the rake, himself falling with it. One of the teeth (all of which were made of round wood, and sharpened to a point) penetrated the abdominal cavity at about the central part. The point of the tooth, which was "broomed up" by striking stones and other substances when in use, caught the omentum; and on its return it brought a large portion of this membrane away with it. The owner saw the accident occur; but as the colt jumped up at once and trotted off, he did not think it was much hurt; and as it was getting dark he could not see the protruding omentum.

The next morning the owner discovered something hanging from the colt's belly, which he supposed to be part of the intestine. It was protruding so far that when the animal walked he stepped on it with his hind feet. On examination I found this protruding membrane to be the omentum. It was almost black in colour, cold, and torn in shreds, from having been dragged on the ground during the night. The colt was at once removed to a comfortable stall, and being properly secured I forthwith by gentle tension drew forth all the membrane that would come away without too much force. I then placed a ligature around it, close to the abdomen, and removed the protruding portion with the knife. Two sutures were also inserted across the opening in the belly. The wound only required ordinary dressing afterwards, and very little medicine was given, as no unto-

ward symptoms declared themselves. Great attention, however, was given to nursing, and all the food which was given was in small quantities and at short intervals. In about four weeks the colt was turned out, having nearly recovered. He soon got quite well, and with the exception of a small enlargement, about the size of a walnut, there are no ill effects of the accident to be observed. The colt was broken to work this spring; and both in health and spirits he appears equal to any other horse on the farm.

[In a postscript to his communication Mr. Shaw says that, in treating cases of poll-evil and fistulous wounds, he has found Fowler's Solution of Arsenic mixed with the patient's food or water in half oz. doses night and morning to produce a very beneficial influence over the healing process. He recommends that all animals suffering from poll-evil should have perfect cessation from work of every kind, and be liberally supplied with the most nutritious diet that can be procured.]

Pathological Contributions.

ADHESION OF THE HEART TO THE PERICARDIUM.

Mr. Helmore, M.R.C.V.S., Stratford, has informed us that he was lately called upon to make a *post-mortem* examination of a cow which had died from an attack of contagious lung disease (pleuro-pneumonia), when he found among the other pathological changes which the viscera of the thorax had undergone, that an adhesion of the heart to its sac, over the entire surface of the organ, had taken place.

In our last number a similar case of adhesion was recorded by Mr. Lepper, M.R.C.V.S., Aylesbury, as having occurred in a mare, the subject of acute disease of the pleura arising from over-exertion. Cases of this kind are, probably, not so rare among animals as some pathologists have supposed. We have little doubt that an adhesion of the heart to the pericardium has occasionally been overlooked, especially in cases associated with extensive fibrinous deposits upon the pleura.

CANCEROUS DEPOSIT ASSOCIATED WITH MELANOSIS IN A SHEEP.

An opportunity has been afforded us of examining the lungs of a sheep and portions of the muscles of the right hind eg, in which extensive melanotic and cancerous deposits had taken place. From inquiry we also learn that the liver was similarly affected. The animal was seen dead in the slaughter-house of the Metropolitan Market by the inspector of the cattle, Mr. Rayment, M.R.C.V.S. No history of the case could be obtained beyond the fact that the sheep was an imported one, and, like German sheep in general, that it was of a white-faced breed. A fracture of the femur of the diseased limb had taken place, which, together with the impoverished state of the animal, had led to its being condemned and sent to the slaughter-house. Both melanosis and carcinoma are rare affections in the sheep. The microscopic appearances did not essentially differ from those observed in these deposits in other animals.

FATALITY OF PLEURO-PNEUMONIA.

A serious outbreak of pleuro-pneumonia has occurred in the neighbourhood of Stockton-on-Tees, due, as is believed, to the purchase of some infected Irish cattle in Stockton market. At the time we received information of the circumstance from Mr. Hall, M.R.C.V.S., in a herd of twenty animals—chiefly milking cows—which had been attacked, fifteen had died, three were still ill, and two were supposed to have recovered.

The inspectors of our fairs and markets should bear in mind (especially now that this disease has become so rife in many parts of the country) that, by the 30 & 31 Victoriæ, cap. 125, it is enacted, that "if any person exposes for sale in a market or fair, cattle affected with pleuro-pneumonia, or sheep affected with scab, he shall be deemed guilty of an offence against this Act, unless he shows, to the satisfaction of the justices before whom he is charged, that he did not know of the same being so affected, and that he could not with reasonable diligence have obtained such knowledge."

Facts and Observations.

The Nature of Vaccine Lymph.—M. Chauveau, of Lyons, has separated by dialysis the various elements which constitute the fluid contents of the vaccine vesicles. It consists of, first, an albuminoid plasmic matter, relatively abundant: this does not include the lymph; secondly, of white globules equally inert; thirdly, of solid molecular granules, which alone are active. Mixed even with ten times their volume of water, they give rise to legitimate and active vaccinal effects.

Microscopic Elements of Vaccine Lymph.—In vaccine, as well as in variolus lymph, Dr. F. Keber, of Dantzic, says that he has recognised peculiar organic bodies, and a very active series of changes. He has found such bodies in vaccine lymph, in the lymph of smallpox, and in that of varicella. He has not been able positively to satisfy himself of their occurrence in the blood of the affected, or in the air which surrounds them. The character of the bodies is as follows:—Granular cells 1-150th to 1-300th of a line in diameter, innumerable free nuclei from 1-800th to 1-3000th, and numerous minute molecules. The cells cannot be mistaken for pus corpuscles; they have a very fine membrane which swells with water, and present a characteristic appearance quite distinct from mucus or pus corpuscles.

Reported Outbreak of a new Cattle Plague.—A very subtle and terribly fatal disease is said to have shown itself among the cattle in some portions of Illinois. Over one hundred head fell victims to it within a few days. It usually kills in a few hours. No premonitory symptoms are to be observed; and although all the skill in possession of ordinary practitioners has been brought to bear upon it, it yields to no remedy or treatment, and is fatal in every instance. Its nature has not yet been determined.

Vivisection.—The petition to the Imperial Senate of France, asking the Government to prohibit the performance of surgical experiments on living animals in the Veterinary School, has been rejected by that august body.

The Equivalent of Horse Power to the Annual Produce of Coal.—The annual coal produce of the United Kingdom is equivalent to the power exerted by 530,000,000 horses working eight hours per day for one year.

THE VETERINARIAN, JULY 1, 1868.

Ne quid falsi dicere audeat, ne quid veri non audeat.—CICERO.

VETERINARY EDUCATION.

"THE question of the day" is the title of a communication from Mr. Greaves, which we publish in our current number. How to educate the student of veterinary science most effectually, and in a manner to ensure him success in his future professional career, is a question which we have discussed again and again, at the risk it has occurred to us more than once of pursuing the subject *ad nauseam*. Our arguments have been based on the principles of social and scientific progress, and we have felt ourselves absolved from the necessity which besets the originator of a scheme of education applicable to the general public; that is to say, we had convinced ourselves and have desired to convince others that no question of over-educating the student of veterinary science could possibly present itself. The agricultural question of the day is just now the education of the farm labourer, and the extreme difficulty of the problem consists in the fact that it is not only possible but perfectly easy to so cultivate the intellectual faculties that their possessor would no longer tolerate the idea of following the plough for a living. Such an obstacle in reference to the mental culture of the professional man we did not perceive to exist; in fact, in our last article on the subject, we distinctly assserted our conviction that it could not occur. On the very ground, however, where we, representing as we imagined the feelings of the profession, believed ourselves to be quite inaccessible, we are attacked, and by an authority of no less weight than that of Mr. Greaves, whose long experience, great practical knowledge, and professional success, entitle him to speak with decision upon such a subject as the proper way of educating young men for efficient veterinary surgeons.

Before we discuss the propositions which Mr. Greaves

lays down, it is necessary that we should clearly indicate our own reasons for what might be deemed a premature proceeding on our part in commenting upon a fragment only of the author's essay.

Mr. Greaves's first proposition is in and by itself a perfectly independent and certainly a startling one, so entirely opposed to the spirit of the age, and so comprehensive in its character, that its acceptance would at once negative all previous affirmations of the necessity for a highly scientific education for the veterinary student. And besides this, its admission would emphatically prove all his subsequent propositions, which are merely consequences of the truth of the first.

Therefore it is that we think it just to Mr. Greaves, and in accordance with our duties to the profession, to at once proceed to the discussion of a question so momentous as that propounded by the writer of the paper, and we venture to express a wish that the subject shall be finally determined by the voice of the profession. It is we may assume universally admitted that the present system of veterinary education requires certain modifications to meet the requirements of the times. All the members of the profession who are virtually interested in the matter decide now what those modifications shall be. It would be lamentable if after much struggling and ultimately successful labour a new system of instruction should be established and be met by the dissent of those for whose advantage it has originated, not without considerable self-sacrifice on the part of those who laboured to perfect it. The profession is not so large but that all its members may speak out, and whatever difference of opinion there may be, it will at least be much easier to arrange an educational system, based upon the evidence thus obtained, than to grope on in doubt and darkness, only to find on emerging into the light that we have missed the intended path after all. Arguments upon such a subject as professional education cannot degenerate into personalities; we may, therefore, pursue the inquiry in good faith; and however energetic may be the expression of opinion there is no risk of any being offended;

the only motive that can actuate those who may take part in the discussion, is the advancement of the veterinary profession. No one desires less than this; and in seeking the good of the greatest number individual interests are lost sight of. We ask for the arguments which Mr. Greaves has advanced, and intends to offer, all the consideration which they deserve, and we are convinced that the author of them will demand no more.

Taking the first proposition, which is put interrogatively, and placing it in juxtaposition with the prominent arguments by which it is supported, the whole statement amounts to the following:

That the veterinary profession is of such a nature as not to require of its members a highly scientific education as an essential condition of success in practice. On the contrary, highly intellectual cultivation has a tendency to produce a distaste for the work, and even it may be drudgery of every day practice. The last member of the sentence implies a truth which if not startling by its novelty is, at any rate, sorrowfully stern in its teachings; the fact that in the main manual labour is entirely undignified, and often in its nature degrading.

"In the sweat of thy face shalt thou eat bread," does not convey, nor was it ever intended to suggest the idea of a blessing. It is better to accept the stern decree in all its bitterness, than to seek poetic license to gloss it over. Equally indubitable is the conclusion that all true mental culture results in the elevation of the moral faculties and social tastes, and precisely at this point commences the construction of a problem the solution of which will occupy the world to the last, how to reconcile high mental culture with the necessity for mere bodily labour. That good honest, useful, manual work is positively incompatible with the possession of a highly cultivated intellect, we distinctly decline to allow; but we go with our correspondent so far as to admit that an exclusive attention to the higher branches of science indisposes the student to the lower pursuits which belong to what is termed, and fairly so, the drudgery of the profession. And having before us both the higher

and the lower, presuming one of them only to be attainable, the question is which shall we elect to hold, firmly and irrespective of consequences. Before deciding this question we must state a difficulty which we experienced at the commencement, and which has at this point become nearly insurmountable. The question that most requires solution, and upon which all argument must ultimately turn is, What is the highest attainable object of veterinary science? Until the query is answered, and answered decisively, there can be no common ground of argument. If the ultimate object of the pursuit is to get money; if to bring grist to the mill is the final aim of every step in advance which the veterinary surgeon takes, then it certainly follows that high mental culture will rather retard than advance the material interests of the profession, because it will at the outset teach, and with an authoritative voice, the utter ignobleness of striving for mere riches, and the entire impossibility of any great and noble object being achieved, so long as commercial success is the principal end in view. We do not deny the necessity which is laid upon every man to earn his daily bread, but there is a vast difference between taking the reward of professional labour as a means of subsistence, and making money the first and prominent object of the work. It is very far from our intention to suggest that Mr. Greaves exclusively advocates this object; but as some of his remarks may at least be strained to bear this interpretation, we think it due to him and to the profession that no doubt should be allowed to exist upon this most vital question. No compromise is possible—money either is or is not the ultimate object of professional pursuit. We are prepared to follow out the argument to its logical conclusion, whatever the decision may be, but before we begin the discussion let the first principles be determined.

Our ideas of a system of education which will produce the most efficient veterinary surgeon will materially depend upon what shall be agreed upon as the exact definition of "efficient," whether it means commercial aptitude, the power of pushing on, and, as Mr. Greaves writes it, the capability of keeping his customers, and making every

step he takes and every horse he touches bring grist to the mill, or scientific attainments, the possession of an intellect keenly and actively alive to the grandeur of all knowledge, a vast conception of the beauty and even the sacredness of the healing art; a power of realising the marvellous unity of pathological and physiological phenomena; love of research; an all-controlling and resistless desire to add something to the stock of human knowledge, and to the means of alleviating suffering.

We repeat, it makes a wide difference whether the "efficient veterinary surgeon" is one who aims at all these things, and seeks them for their own sake, and because they are essentially true, and good, and noble, or whether he is satisfied to take just so much of them as may be made to pay—and no more. Two perfectly well-defined courses are open to us. We ask, which of them shall be followed? We cannot take both, because they infinitely diverge.

Reviews.

Quid sit pulchrum, quid turpe, quid utile, quid non.—Hor.

The Horse: How to Feed him, avoid Disease, and Save Money. By George Armatage, M.R.C.V.S., Professor of Anatomy and Physiology in the Glasgow Veterinary College, &c. London: Warne and Co. 1868.

Owners of horses and all who are interested in their management will glean many useful facts, and, better still, valuable general principles, from this small volume. The author's aim appears to be to decide what plan of feeding is most economical, by a careful comparison of the different systems adopted in various large establishments with which he has been connected or has had opportunities of examining by the aid of professional friends, to whom he expresses his obligations. By an economical system of feeding it is not intended to convey the idea of primary low cost of materials, but rather to suggest the propriety of determining the actual nutritive value of the articles of food, and their influence upon the animal's condition, and thus to settle the question of cheapness by means of the results obtained. At page 81

are our author's remarks in reference to what constitutes a cheap food:—

"It is usually considered a cheap mode of feeding, when material can be supplied for one penny per pound, and I find several owners base their calculations of cost at this rate. But it must be borne in mind that food costing only one penny per pound is not inevitably an economical food. We must look farther than mere cost. Economy does not consist in price alone; to such must be added the veterinary surgeon's account, whose services in the main will be found to have been occasioned by the supposed economical food, and, in addition, the value of the amount wasted by refusal, fermentation, or that which is hastened through the bowels in the state of 'partial digestion' so much insisted on."

It is beyond dispute that innutritious food is not economical at any price, and it is equally certain that a large proportion of the diseases to which men and animals are subject may be referred to excessive, deficient, or improper food. Steamed or cooked food, which was at one period so fashionable, is thus alluded to:—

"The process of steaming food may answer well where inferior food and hay abound; cattle are to be fed, and aged dependents require some light employments. But, as applied to good food, and carried out in the manner alluded to, it is a complete farce, a useless addition to expenditure."

By pointing out the numerous errors which occur in stable management, especially where large numbers of horses are congregated, and by explaining the principles on which a consistent and practically valuable system of feeding should be based, Professor Armatage has done good service to the animal whose welfare he advocates, and he has written a book which will be read with profit by many members of the veterinary profession who have not hitherto, perhaps, concerned themselves much with the daily routine of stable business.

The Medical Profession and its Educational and Licensing Bodies. By E. D. Mapother, M.D., Queen's University, Professor of Anatomy and Physiology, Royal College of Surgeons; Medical Officer of Health and Surgeon to St. Vincent's Hospital. Dublin: Fannin and Co., 41, Grafton Street. London: Longmans and Co. Edinburgh: Maclachlan and Steward. 1868.

Having received from the Royal College of Surgeons in

Ireland the first "Carmichael Prize," Dr. Mapother's work comes to us with the highest stamp of professional recognition and approval. The book is not, however, what perhaps might, by the general public, be anticipated a dry criticism on the sciences of anatomy and medicine; nor an erudite dissertation upon the origin and progress of the healing art. A succinct treatise upon the science of therapeutics and surgery in its political and social aspects undoubtedly it is, but so far from being dreary in its style, we found the perusal of it to be a pleasant and profitable occupation during a railway journey. Nowhere else have we found so readable a history of the whole system of medicine, its rise, advancement, objects, offices, schemes of education, reform, aspirations, political status, and social position, past and present, as in this volume of some two hundred pages. Our author deals with his subject honestly, shirking no responsibility. In his estimation of the aims and objects of his art he is modest; in the exposure of wrong, unsparing. Speaking of the unselfish labours of the Edinburgh physicians among fever patients in 1847, he says:

"The infirmary, overcrowded with twenty times its usual number of cases, was a huge focus of contagion, to serve in which was certain infection to doctor or nurse. Of 22 resident physicians 12 took the fever; of 9 attending physicians 6 had previously the disease, and the 3 remaining now contracted it. Four of these officers were lost, a heavy tribute of the medical profession to the carelessness of the community in not providing for the approach of epidemics.

"Such forgetfulness of personal danger may not equal the brilliancy of military heroism, but surpasses it in usefulness, and should meet with adequate recognition."

The chapter entitled "The First Charter" is an interesting account of the efforts of the medical profession to obtain legislative aid to assist in the extrication from "the state of disorganization into which it had fallen." On this subject the author, at page 18, quotes Mr. Carmichael's words to the following effect:

"While the choice of the law or church raised a man's social position, devotion to medical science lowered it."

Professor McCartney also said:

"I am quite satisfied that it would be better for society that the profession were altogether abolished than that it should be suffered to continue as at present constituted."

We remember some few years ago hearing Dr. Sharpey, at a meeting of the members of the veterinary profession, remark that we were in the act of passing through the trials

which the medical profession had already experienced. How literally true the statement was may be judged from Dr. Mapother's quotation.

In the section devoted to the consideration of the office of coroner, the following passage relative to medical evidence occurs, and it is singularly appropriate to the case of our own profession. "Medical evidence upon hygienic pathological or psychological questions in law-courts is every day losing weight, mainly because witnesses range on both sides to debate technicalities or advance opinions which even the judge cannot estimate. If the medical witness were a mere relator of facts no error could arise, but as, without hearing the whole evidence, he is often pressed for an opinion, no certainty of just conclusion is provided."

When discussing comparative anatomy and pathology Dr. Mapother alludes to the opportunities of investigation which are enjoyed by the veterinary surgeon. At page 151 he says:

"In Ireland there is yet no means of teaching the veterinary art, and great losses to the agricultural interests of the country ensue. A novel malady, termed 'charbon,' is at present rife among cattle, sheep, and swine, and has been communicated with fatal results to several human beings."

Remarking upon the Continental system, the author says:

"In Austria and Prussia all medical students are obliged to study the disease of animals; and if they settle in remote districts, to treat them as well as human maladies. Those who are expert in veterinary medicine are preferred for district physicians."

The various systems of teaching and modes of examination are passed in review, and valuable suggestions are offered for the proper training and efficient testing of candidates for medical honours. We can very consistently recommend the work to the members of the veterinary profession, and also to the non-professional public; the subjects upon which it treats are of universal interest, and the style of the composition removes it from the restricted sphere in which works on professional matters generally are doomed to circulate.

Extracts from British and Foreign Journals.

EXPERIMENTS WITH LIGATURES.

Dr. B. Howard, at the end of last year, exhibited to the Pathological Society of New York three specimens of ligature of the carotid arteries in sheep, by different ligatures, and in different manners. In the first experiment, he applied a silver wire ligature to the common carotid of a very strong sheep, and fastened it by twisting it very tightly. Fifty-six days afterwards, he cut down through the cicatrix, and found that the collateral circulation which was established was very complete; and that the capillary circulation was not great; so that there was little hæmorrhage. On coming down to the point of ligation, he was astonished to find what at first appeared to be an aneurism, but which turned out to be an abscess full of inspissated pus. It occupied a space of about four lines on either side of the ligature, beyond which points the plugs were intact for about seven lines. In the centre of this abscess lay the ligature with the middle and lining coats of the artery completely sloughed away and detached.

In the second experiment, he used a leaden ligature, and had it rather large in order to avoid its cutting through; he tied it tightly. Twenty-six days after, he cut down through the cicatrix, and instantly a pellet of pus appeared in the incision, as if propelled from behind. He made another incision, when the ligature came away. As he proceeded towards the original site of the ligation, the hæmorrhage was exceedingly great. He ligated above and below, and removed the abscess. There had been a good deal of inflammation around the artery, and there was considerable fibrinous material effused in the neighbourhood. The artery itself was well plugged on its cardiac and distal aspect, and was perfectly occluded. Between the proximal end of the distal plug and the distal end of the cardiac plug was apparently an abscess containing about a drachm and a half of sero-purulent fluid; otherwise, the clot was perfect. The points of interest in this specimen are the great amount of irritation and inflammatory action that occurred about the metallic ligature. In the third experiment, he again used a silver wire ligature, but tied it incompletely after the manner of the silk ligature, and was careful to tie it loosely—tight enough to diminish the canal of the artery, but avoiding a complete

closure. On cutting down afterwards upon the cicatrix, he could scarcely discover where the ligature had been applied, so small was the amount of irritation it had produced. The plug in this case was more perfect than in either of the other cases. There was no abscess, the fibrinous deposit being just sufficient to cover the ligature. The result so far as occlusion, extent, and firmness of the plug are concerned, is very much better than in either of the other cases. From these experiments, so far as they go, he concludes, 1st, That the metallic ligature does not always reside quietly where it is placed. 2nd. It is not always necessary for complete occlusion of the artery to tie the ligature so tightly as to divide the middle and internal coats. 3rd. The last experiment is very suggestive; that a silver wire ligature applied so loosely as to produce no lesion of the artery, nor even to completely arrest the circulation, may suffice for the cure of aneurism, when an ordinary ligature would be rendered inexpedient by the condition of the arterial coats.—*Medical Record.*

EFFECTS OF LIGHT ON VITALITY.

In a remarkable paper addressed to the French Academy of Sciences, Dr. Dubrunfaut examines the effects of light on vegetable and animal life. The researches of MM. Gratoillet, Cloëz, and Cailletet, have in a great measure proved that the red rays of the luminous spectra are those to which the important physiological functions exercised by the sun on plants is to be exclusively attributed. The leaves in this case act as analysers of white light; they reject the green rays, which constitute the physical complement of the red ones; and it is thus the various hues under which the organs of vegetation are seen by us may be explained. If plants were exposed to green illumination only, that would be tantamount to their being in the dark. But this kind of light, which the vegetable kingdom refuses to absorb, is precisely that which is coveted by the animal one. Red, the complementary colour of green, is that which, owing to the blood, tinges the skin of the healthy human subject, just as the green colour of leaves is the complement of the one they absorb. From this principle, so fully established by experiment, M. Dubrunfaut passes to its practical application to domestic life. All kinds of red should be proscribed from our furniture, except curtains. Our clothes, which in point of fact play the part of screens, should never be green,

while this colour, on the contrary, should predominate in our furniture, its complementary one being reserved for our raiment. In the same way he contends that the salubrious influence of woods and forests is a luminous, and not a chemical effect. In support of these views he mentions cases of patients whose broken constitutions were restored merely by long exposure to the sun in gardens deprived of trees or other obstacles to light: he quotes the instance of four children that had become chlorotic by living constantly in one of the narrow streets of Paris, and that regained their health under the beneficial influence of the solar rays on a sandy sea-coast.

THE ATMOSPHERIC GERM THEORY.

(*A Lecture delivered to the Royal College of Surgeons, January* 17, 1868.)

By John Hughes Bennett, M.D., F.R.S.E., Professor of the Institutes of Medicine and Senior Professor of Clinical Medicine in the University of Edinburgh, &c. &c.

(*Continued from* p. 379.)

2. *Chemical Experiments which have been directed to destroy the supposed Germs in the Atmosphere, so as to prevent Fermentation and Putrefaction.*

Schutze, in 1837,* after heating an infusion to the boiling point, connected it with two of Liebig's bulbs, one containing sulphuric acid, and the other concentrated solution of potash. The air forced through these liquids he thought capable of destroying the atmospheric germs.

Schwann also, in 1837,† forced air, with the same view, through metallic tubes heated to redness; and found, when so calcined, it occasionally prevented infusorial growth. He thought that oxygen alone was not the cause of fermentation, but some substance in the air capable of being destroyed by heat.

Schræder and Dusch, in 1859, filtered the air through cotton before bringing it in contact with organic fluids. They found that some did and others did not undergo putrefaction, and were induced to believe that the presence of oxygen, and the formation of an acid, were the cause of fermentation. Schræder afterwards found that the yolk of an egg, milk, and

* 'Poggendorf's Annalen,' 1837, p. 41; and 'Edinburgh New Philosophical Journal,' 1837.

† Poggendorf's 'Annalen,' 1837, p. 184.

the juice of meat without water, putrefied in air filtered through cotton, and supposed it to contain an active substance, the nature of which was unknown.*

The experiments of Schutze, Schwann, Schræder, and Dusch have been frequently repeated without preventing the growth of fungi.†

Again, it is almost universally considered that the heat of boiling water or cold at zero will destroy all kinds of animal and vegetable life. Indeed, to imagine that the minute molecules or vibrios of which we have been speaking, or small ova and sporules consisting of oleo-albuminous matter without any envelope, would remain in boiling water for hours and retain their vitality, must be regarded as a violent assumption. Three or four minutes' boiling of a hen's egg not only kills it, but converts its whole substance into a hard mass. There is no seed known which, when taken out of its indurated shell or case, is capable of germinating after being boiled for a short time.‡ Yet nothing is more certain than that long ebullition of various infusions has wholly failed to prevent the formation in them of animal and vegetable growths.

Pouchet and others have frequently performed the following experiment:—An open flask was plunged into and filled with a decoction of barley which had been boiling for six hours. A stopper was introduced into it below the liquid, and on taking it out the whole neck of the flask was immediately plunged into melting sealing-wax, and hermetically closed. In six days some yeast was observed in it, at a temperature of 18° Cent. The following day the temperature was raised suddenly to 27°, when the flask burst, and then it was seen by the naked eye, and by the microscope, that it contained a notable quantity of yeast.§ Now, yeast is a plant, which was thus proved to have grown in an infusion that had long been boiling, and from which all atmospheric air had been expelled. As, therefore, neither calcined air, sulphuric acid, liquor potassæ, gun-cotton, nor a boiling temperature have failed to prevent the production of infusoria, or destroy the supposed germs in the air or infusion, I determined, in 1863, to try the effects of all these destructive agents, with

* Quoted by Pasteur, opus cit., p. 16.

† See 'Pasteur,' opus cit., pp. 34, 35. Pouchet's 'Hétérogénie,' p. 252, et seq.

‡ See some conclusive experiments recently performed on this subject by Meunier. 'Comptes Rendus,' tome lxii, p. 992. See also Pouchet's 'Experiments on the Seeds of Medicago from Brazil.' 'Comptes Rendus,' tome lxii, p. 941.

§ 'Hétérogénie, p. 629.

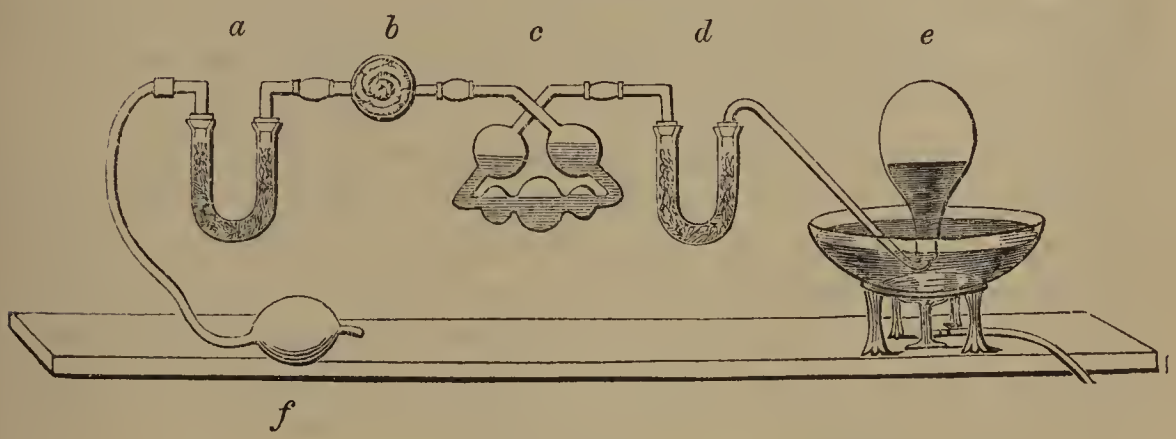
the exception of the first, at once, and with the greatest possible care.

First Series of Experiments.

On the 17th and 18th of October, 1864, I performed the following experiments in my laboratory, with the assistance of Dr. Argyll Robertson :—

Decoctions of liquorice root, of tea, and of hay were kept at the boiling temperature in a porcelain basin, over a gas flame. Flasks filled with and inverted in the boiling fluid, had air pumped into them to the extent of three-fourths of their volume, which had passed through (1st) a U-shaped tube containing liquor potassæ; (2nd) Liebig bulbs, containing sulphuric acid; (3rd) a hollow glass ball containing gun-cotton; and (4th) another U-shaped tube with sulphuric acid. All the bent tubes were filled with fragments of pumice-stone, to break up the air, so as to prevent the possibility of any germs passing through in the centre of bubbles. The bent glass tube leading from the last U-shaped tube, filled

Fig. 12.



Arrangement of the Apparatus employed.

a. Bent tube containing liquor potassæ and pumice-stone. *b*. Hollow glass ball containing gun-cotton. *c*. Liebig's bulbs, containing sulphuric acid. *d*. Bent tube containing sulphuric acid and pumice-stone, *e*. Infusion kept at the boiling point, when air was pumped into it. *f*. Caoutchouc pump.

with sulphuric acid and pumice-stone, was also filled with the acid, so as to destroy any germs that might be supposed to adhere to the interior. After the air so prepared had entered the flask, corks, which had been for some time boiled in the infusion, were by means of iron forceps inserted in the necks of the flasks, and the entrance of fresh air prevented. Further, on removing the flask from the boiling infusion, the cork and neck were hermetically closed by plunging them into melted sealing-wax. At the same time bottles or flasks containing the same infusion, but having a similar proportion

of ordinary air, were sealed or corked up, so as to be contrasted with the influence of the prepared air.

The results were that the infusions in all the flasks in contact with ordinary air, five in number, were rendered turbid, or covered with fungi in from six to twelve days; whereas all the infusions, with one exception, which were exposed to the prepared air, eight in number, also became turbid and contained fungi, but at periods varying from four to nine months.

Some of these flasks I have recently opened (January 7, 1868), and found that they contained deposits of bacteria and vibriones, with molecular débris of an indeterminate character.

Second Series of Experiments.

About a year afterwards, on the 3rd and 13th of October, 1865, the experiment was repeated in exactly the same manner, with separate decoctions of liquorice and dulcamara roots, and with tea. Again, flasks holding similar decoctions with ordinary air were contrasted with those which held the prepared air. In these last, three in number, fungi appeared in from six to twelve days; and in the former, all, nine in number, with one exception, contained fungi, or were very turbid, in periods varying from four to nine months.

The exception, which I now show you in the first series of experiments, was a decoction of hay; and in the second series, a decoction of dulcamara root. It will be observed that both these infusions in the flasks remain clear and without the slightest sediment or pellicle, although the prepared air they contain, the fluid, the flask itself, and the mode of closing and sealing it, were identically the same as in all the other flasks which were filled and closed at the same time. To suppose that these two flasks were the only ones from which atmospheric germs were excluded, must appear to those who will examine them all, a strong assumption. Neither can it be true that in all the flasks, except one in each series, air could have entered since they were closed. I have placed the whole in vacuo under the bell-glass of an air-pump, and from none could any air whatever be extracted.

Three of the flasks in the second series of experiments I have opened, and found in two the same molecules and indeterminate débris as in the others; but in the third, a white cottony fungus, the size of a small pea, was floating in a tolerably clear decoction of dulcamara, which, on microscopic examination, was composed of minute jointed filaments forming a dense network.

Third Series of Experiments.

A third series of experiments was performed with the assistance of Dr. Rutherford, October 14th, 1867. In this case glass-stoppered bottles were employed, it having been suggested that sporules or germs might have been concealed in the corks formerly employed, although they had been well boiled. In this case we employed weak decoction of tea, of beef, and of hay, taking care, as before, that one bottle having ordinary instead of prepared air introduced should be kept for the purpose of comparison. In all the bottles with common air, six in number, fungi appeared in from one to two months and a half. In one bottle air was passed through carbolic acid only, and you see that it presents a distinct proligerous membrane; all the others as yet remain unchanged, but we cannot as yet regard the experiments as complete.

Fourth Series of Experiments.

In all these cases it will be observed, that the prepared air was passed through a boiling fluid, and was consequently rarefied. It occurred to me to allow the fluid in the inverted bottles to get cold before introducing the prepared air. This was done in four cases, December 28th, and I show you that a fungus has appeared in all. It would seem, therefore, that rarefaction of the air greatly influences the result. It may easily be conceived that air subjected to a boiling temperature is so expanded as scarcely to merit the name of air, and that it becomes more or less unfit for the purpose of sustaining animal or vegetable life.

Fifth Series of Experiments.

A fifth series of experiments was performed on the 4th of the present month (January, 1868), with the same precautions, and with an infusion of dulcamara only. We filled sixteen bottles. Into four of these we pumped ordinary air into a cold infusion. Into four others ordinary air was pumped into a boiling infusion, and we repeated this experiment with four bottles each of the boiling and of the cold infusion with prepared air. The result up to the present moment is, that the fluid has become turbid only in the four which contained ordinary air not rarefied.* This experiment also is not yet complete, but serves to show the great influence of rarefied air.

* A fungus has since appeared in one of the bottles containing non-rarified prepared air. (Feb. 12.)

Sixth Series of Experiments.

A sixth series of experiments was performed on the 11th of the present month. It having been asserted by M. Pasteur* that passing air through bent tubes, by hindering the access of germs and allowing them to be deposited on the sides of the glass, prevented the growth of infusoria, twelve bottles were prepared, four of which contained an infusion of dulcamara, another four a decoction of putrid meat, and a third four, yeast water. The bottles were plunged into and filled with the infusion when boiling, inverted in it, and allowed to get cold. The air was pumped gently through a bent tube, five feet in length, having fourteen sharp bends, each four inches long, into three bottles of each series, and ordinary air was admitted to the fourth. The result is, that already, January 17th, the fluids in all are turbid, with the exception of two bottles containing infusion of dulcamara,† so that bent tubes appear to intercept none of the supposed germs.

These experiments, on the whole, appear to me to be totally adverse to the atmospheric germ theory, and to indicate that the production or non-production of infusoria depends, for the most part, on the temperature, chemical constitution, density, and other physical properties of the air, rather than on living organisms there, which are developed in the fluid. Still, in every series of experiments, it will be noticed that there are one or two exceptions. This has also been observed by Pasteur in most of his experiments, and he attributes them to some currents or limited portions of air being rich in germs, whilst others are free from them.‡ But that this explanation applies to my laboratory, in which all the experiments described were made, is not probable.

It is now admitted by M. Pasteur that the boiling temperature, that is, 100° Centigrade, does not prevent the growth of the supposed germs in the atmosphere; but instead of considering this fact hostile to his theory, he concludes from it that the germs have the power of resisting that amount of heat, and of being most tenacious of life; but he says, 130° Centigrade always destroys their vitality. M. Pouchet, however, has shown that the air, and the organic matter placed in boiling water, will germinate after they have been exposed to a heat of even 150°, and he says it may be raised

* 'Comptes Rendus,' tome l, p. 306.

† These also have since become turbid. (Jan. 30.)

‡ 'Comptes Rendus,' tome li, pp. 350, 351.

to 200° Centigrade, and yet animalcules and fungi will develope themselves.*

(*To be continued.*)

Translations and Reviews of Continental Veterinary Journals.

By W. Ernes, M.R.C.V.S., London.

AN ESSAY ON THE SUPPLY OF BLOOD TO, AND THE FUNCTIONS OF, THE SPLEEN, THYROID GLAND, AND SUPRA-RENAL CAPSULES.

Presented to the Royal Academy of Medicine of Belgium by Dr. Fossion, Honorary Member of the Academy, &c.

The thymus gland and the supra-renal capsules are organs of fœtal life. The former constitutes in man and the mammalia a voluminous mass, composed of two parts, which by their disposition may be said anatomically to represent the two lobes of the lungs.

The materials of nutrition to the lungs and the pleura are supplied by the two bronchial arteries and the branches of the internal mammary artery.

The thymus during fœtal life receives a large quantity of blood from the two thymic arteries, and from the ramification of the internal mammary, which, like the bronchial branches, arise from the aorta.

The origin of the blood-vessels which supply the thymus merits our consideration, as, like the thyroidian arteries, the vessels are well adapted for diverting the blood, which is also the function of these organs.

It will be objected, no doubt, that the blood-vessels of the thymus do not always branch off from the above-named arterial trunks. This observation, which emanates from the description which authors have given of the origin of the blood-vessels that supply the thymus, can only be of value in exceptional cases, and in the mode of the origin of the blood-vessels of the lungs; for it is possible for the latter to have also an exceptional origin. On the other hand, it is true that the thymus does not receive any large arterial trunks, and is not supplied with any large quantity of blood. It must be observed that the arteries which supply

* 'Comptes Rendus,' tome l, p. 1015.

the lungs, not being voluminous, those of the thymus necessarily correspond, as they have only a proportional importance in reference to those of the lungs.

Possibly it may be also alleged against the opinion which we shall endeavour to establish, that the thymus is not exclusively a gland of fœtal life, but that it exists up to a certain age.

This is true in part only. It must be acknowledged that this organ does not follow in its development that of the lungs, which, compared to the thymus, are very small in size at the time of birth.

In taking this fact into consideration it is important not to lose sight that, though respiration begins as soon as the child is born, it is only perfect at the age of puberty. Thus we are able to account for an increasing quantity of carbonic acid evolved in the act of respiration.

The lungs in early life, not being endowed with all the activity required in the adult, have no need to consume so large a quantity of the elements of nutrition as when the respiration is in its full activity, which will then be indispensable. It is for this reason that the thymus, being useful to a certain extent, still continues to exist, and indeed only to disappear at the age of eighteen to twenty-four.

The facts revealed by comparative anatomy are also of great service in determining the use of the thymus. The study of human anatomy alone frequently does not suffice to explain the function which an organ has to accomplish. We admit that the thymus is strongly developed in animals which, like fishes, have no lungs. It will be asked, and not without reason, what is the use of an organ destined for diverting the blood from another organ which has no existence? In reply, it may be affirmed that we cannot rigorously determine the function of an organ which does not exist in every individual of the animal kingdom.

There are, besides, some species which clearly show that which in others is enveloped in obscurity. Man cannot suspend his respiration for ever so short a period without endangering life. It is not so with all animals. The otter, and the bear, the divers, and hibernating animals, can exist for a more or less protracted period without respiring. In these animals respiration is intermittent, and so likewise is digestion. This mode of existence causes modifications in their organization which prepare the mind for the conviction that the thymus gland is nothing more than an organ for the derivation of the blood which is supplied for nutrition of the lungs. In fact, the thymus in these creatures persists

during the whole life of the individual, the same as the spleen. In the adult serpent there is found a substance which presents the same organization as the thymus in the human subject. This organ is oblong in shape, and is situated above the heart, in the neighbourhood of the lungs. It has no excretory canal. There is, however, no positive proof that this organ is similar to the thymus of mammals.

The voracity of serpents is well known; they swallow prey of enormous size, and from the position of their lungs they can cease to respire during the whole time of deglutition. They afterwards enter into a state of stupor, and their respiration, so to speak, becomes suspended. We can conceive, in this instance, the necessity of an organ for the derivation of the blood. The thymus gland probably serves that purpose.

Birds are all provided, when young, with two small elongated bodies, situated at the entrance of the pectoral cavity. Tiedemann considered them as representing the thyroid glands, but Meckel and several others viewed them as analogues of the thymus gland. In the diving birds they exist during the whole period of life.

The thymus is strongly developed in the fœtus of mammals, and persists during infancy and youth; afterwards it shrivels, and disappears altogether. There are certain species, however, in which it exists during life.

In the adult bat the thymus is, according to Prunelle, so small in the spring and summer that it only appears like a small parcel of filaments of a reddish colour; while, on the contrary, in winter it occupies nearly one half of the cavity of the chest, and extends even as far as the pericardium by appendices, which interlace themselves between the large blood-vessels. These observations are in conformity with those of Meckel, who likewise found this organ largely developed in the adult bat. All anatomists who have examined the structure of the adult bat have recognised an enormous glandlike body, which occupies part of the cavity of the chest, and extends along the neck on both sides. This substance, says Prunelle, becomes very large in the autumn and winter, and extends from the curve of the aorta to the posterior part of the neck. It does not appear to be constituted of one single body, but of several small bodies united together. In several of the rodents the thymus presents, during the whole period of life, a considerable size, but it is more strongly developed in the autumn and winter than in the spring and summer. I had an opportunity of examining the thymus in the dormouse. It was in the beginning of October last year. I found it of a rather large size and to occupy nearly

the whole of the anterior part of the chest, being united with the thyroid gland. Prunelle has given a description in detail of the thymus gland in the marmot, when in a state of hibernation. "It occupies," he says, "all the anterior part of the chest, from the clavicle to the base of the heart. It sends off from its anterior part, 1st, two prolongations, which proceed laterally along the trachea until they meet with the great thyroid; 2nd, two others, which extend to the axillaries, after having passed under the blood-vessels; 3rd, others which arise from the posterior part, and follow the posterior aorta."

Tiedemann also says that he had observed the marmoth (mountain rat) in a state of hibernation, and found the gland in question of a considerable size.

According to Springuel and many other anatomists, the thymus gland is highly developed even during adult age in all the amphibious mammals, such as the otter, the seal, and the cetaceans; besides, there exists in certain species of the divers, and more particularly in the cetacea, a vascular network posterior to the lungs, on both sides of the vertebral column, which serves as a reservoir for the blood and which is destined to prevent overdistension of the heart. Breschet, in his memoir to the Academy, 1836, has given an interesting description of this plexus.

Those anatomists who have made the study of the thymus their special occupation find that this organ persists during the whole period of life in all animals which have the faculty of suspending their respiration for a greater or less space of time, as, for instance, in those that burrow and live under ground, the divers, and the hibernaters.

It is not to be denied that in all animals there is found in the thoracic cavity an apparatus of a glandlike form which extends frequently on both sides of the throat and under the axillaries. According to Jacobson, Valentin, and Ecker, the structure and organisation of this organ do not assimilate to those of the thymus gland. The enormous development of this organ would be depending on fatty matter connected to the thymus.

In admitting this fact as proved, it still remains to state that this body, which occupies the place of the thymus in its quality of an adipose substance, cannot serve as a derivative of the blood from the arteries destined for the nutrition of the lungs. It is also to be remarked that an organ which has no other office than that of diverting the blood may present great variation in texture. Do not the cells of the thymus in the fœtus contain a liquid in which

there is found a certain quantity of adipose matter? Would it be remarkable if in the adult this liquid were transformed into solid fat? What leads me to believe this might be so is the chemical analysis of Friedleben, this author having studied the chemical composition of the thymus in the calf at birth and the young ox, and found in the former 2 per cent. of fatty matter only, while in the young ox 17 per cent. was present.

Besides, what importance can be attached to the cells of the adipose tissue, as they are found in several other parts, in the areolar tissue, under the skin, &c.? Are these cells not also agents of the derivation of the blood? When it is surcharged with nutritive matter, which cannot be appropriated by the organs, is it not diverted by the small vessels, which get rid of their superfluity by discharging it in the form of fat in small vacuums arranged for the purpose in the interstices of organs?

I ask, again, what is there to wonder at, that this adipose gland annexed to the thymus, or rather part of it, should serve as an organ of derivation? Cuvier, speaking of the supra-renal capsules, said that it was probably reserved to future comparative anatomists to explain their true function. Without being as decided as that illustrious naturalist, I agree with him that the facts revealed by the anatomy of their organisation are a powerful source to determine their function. The supra-renal capsules are situated generally in animals on the inner side next to each kidney. Their shape recalls that of the kidneys; like them, they are composed of two substances, the one cortical, the other medullary. The kidneys in the human subject are composed of a multitude of lobes and lobules intimately united together, so as to form an external surface perfectly smooth; but in the otter, the bear, and more especially in the cetacea, these lobes and lobules remain separate.

In animals where the kidneys are not divided externally the supra-renal capsules also remain separate, but in those where the urinary glands are divided into lobes, the supra-renal capsules are likewise divided into lobes and lobules, which are only united together in the centre.

In the elephant a single substance can only be distinguished in the kidneys, and the supra-renal capsules likewise present a single substance, although in all other animals they present two. All these analogies merit the most serious reflection on the part of physiologists; they show the correlations which prevail between the principal and the supplementary organ.

The arteries of the supra-renal capsules emanate either from the renal artery or the aorta. Note what Cuvier says in reference to the supra-renal veins in the elephant. The capsulary vein forms generally in the interior of the gland a sort of reservoir, which is sometimes double or even treble. It divides into as many large branches, the parietes of which are perforated with a number of minute orifices through which the blood is received from the smallest ramifications. This venous reservoir or trunk of the capsulary vein commences usually in the centre of the gland, is without valves, and opens, after a short course, either into the renal vein on its side or into the vena cava, so that we might be tempted to think that the blood from the one or the other may return into the principal supra-renal if the least impulse stronger than that of the supra-renal veins be given to it. I may ask, is that not part of the function of the derivation which we have endeavoured to demonstrate concerning both the thyroid gland and the spleen?

What is more simple than the idea which we try to establish, viz. the existence of organs the office of which is to detain the blood at certain times from the arteries which terminate in other and more important organs, and, on the other hand, to hold in reserve a certain quantity of venous blood to relieve those vessels which otherwise would become overdistended? The supra-renal capsules, I repeat, are destined to detain the blood from the kidneys during fœtal life, and if they persist after birth, it is to serve for the diversion of the venous blood which would otherwise overdistend the veins of the organs to which they are annexed.

(*To be continued.*)

WEST OF SCOTLAND VETERINARY MEDICAL ASSOCIATION.

THE usual Quarterly Meeting was held at the Athole Arms' Hotel, Glasgow, on Wednesday, the 17th ult., Mr. A. Robinson, President, in the chair.

The names of Mr. John P. Prentice, Glasgow, and Mr. W. Lindsay, Lochwinnoch, Ayrshire, were added to the list of members. Besides a general muster, several visitors were present.

Professor Armatage drew the attention of the meeting to the report which was inserted in the *Veterinarian* for May, announcing

the death of Mr. John Anderson, the son of Mr. William Anderson, of Glasgow. Such report was now found to have originated by a mistake, which the editors of that journal had notified in the succeeding number; and he (Mr. A.) begged to offer his congratulations to Mr. Anderson upon his escape from such a bereavement, in which doubtless the meeting would also feel a pleasure in joining.

The members were unanimous, and the reference was ordered to be placed on the minutes.

Mr. Anderson, having made a suitable reply, proceeded to comment upon certain remarks which had attracted his attention in the report of the "PROCEEDINGS OF THE ANNUAL MEETING OF THE ROYAL COLLEGE OF VETERINARY SURGEONS." Mr. Ernes is there stated to have said, when referring to Scotch schools, that "an opposition school was established in Edinburgh, which competed, not for science, nor for education, but for cheapness. It was a private establishment; the money went into the pocket of a private individual. He obtained the patronage of the Highland and Agricultural Society, and under that patronage he undertook to teach veterinary science. And how did he teach it? He (Mr. Ernes) did not hesitate to say it was very imperfectly taught, talented, however, as the teacher undoubtedly was." To the latter part of this statement he (Mr. Anderson) would give an unqualified denial; indeed, he had no hesitation in stating that from no establishment had there better men been turned out than left the Edinburgh Veterinary College during the period when such men as George Wilson, Finlay Dun, and the late John Barlow, were associated with the never-to-be-forgotten Professor Dick. Even prior to the period he had named, when he (Mr. A.) was a student, and the institution was young, and *no* teachers were engaged to lecture within the walls of the college, imperfect teaching could not be ascribed to the man, or be rightly now associated with his memory. Nearly all the class-rooms in Edinburgh, where medical science was taught, were open to Professor Dick's pupils. He (Mr. A.) could exhibit the class tickets of Sir Wm. Fergusson, Drs. Robert Knox, J. A. Robertson, Thos. J. Aitkens, John Mackintosh, — Murray, and E. B. Sheriffs. Those pupils who preferred had also access to the lectures of Professors Liston and Monro.

Was this like imperfect teaching? What did Professor Goodsir say at the Annual Examinations? "I wish," said he, "the medical students would exhibit, as a rule, the same amount of interest in their studies, and make the same proficiency as the veterinary pupils of Professor Dick." There has been this difference since. Information has not been given so separate from selfish motives as it used to be in olden time. Then it was given ungrudgingly, and with a desire to benefit the inquirer. The pupil embraced it as a noble gift, and when he left college he felt a veneration for his teachers which probably does not exist to the same extent at the present time. He was glad to find there were those at the meeting who refuted such statements and upheld the dignity of their *alma mater*, as well as their motto, "*Nemo me impune lacessit.*" He

thought that "the thanks of this meeting should be given to Mr. Morgan for the interest he displayed on the occasion.

The motion was carried."

Professor Armatage then read a part of the following paper. Considerable discussion followed; after which it was proposed that the paper, together with a report of the meeting, should be forwarded to the editor of the *Veterinarian*, soliciting its insertion in the coming number, in order that its full reading and discussion should take place at a special meeting to be called after the journal had reached the members of the society.

The attention of the meeting was next directed by Mr. Anderson to the "*Report of the Special Meeting of Council of the Royal College of Veterinary Surgeons,*" *on May 26th*, by which it appeared that Professors Williams and M'Call had been elected *Vice-Presidents* of the body corporate. He could not say how these names had been placed there; but he thought that the position in which these gentlemen stood with regard to the proposed Scotch Charter, as *permanent* curators, would not allow its interests to be so well looked after, if they were to be mixed up with the proceedings of a body opposed to the obtaining of the Charter. Mr. A. was not inclined to attribute any particular motive to the council, but as there was no evidence that either of the gentlemen had refused office, their election certainly did not make matters any brighter in the Scotch attempt to obtain a charter.

THE PHYSIOLOGY OF DIGESTION AND ITS RELATION TO CERTAIN PATHOLOGICAL CONDITIONS.

The intimate connection which exists between the digestive organ and system generally is a point which cannot be insisted upon too strongly. The importance of a thorough knowledge of that which is at present promulgated in reference to the subject is patent to all who desire to minister by means of scientific data to the wants and ailments of animal life.

In addition, that connection is varied and extensive, and on these grounds we may justly infer that in this subject will be found sufficient interest to reward for the time occupied in its consideration. It is due from me to state that I was induced to bring the question before this meeting by remarks which passed in conversation with one of the oldest members of the association. I must also express the gratification that was experienced when I was made aware of the intense desire which that member evidently felt to pursue the physiology of digestion, and award to it an importance in the rank of subjects for study second to no other.

Physiology is usually held to be a dry and repugnant subject. I have known it almost ignored by a certain authority, and an elaborate organ declared to possess no other than an extrinsic office, and whose extirpation is of no moment whatever to the animal economy. Such a conclusion is convicting nature with a

vengeance, and by which an estimate may be made of the value placed upon physiology as a branch of veterinary study.

I could wish, gentlemen, there were many others like our esteemed friend Mr. Anderson, who, although so long since retired from the benches of the class-room, nas lost none, but rather acquired more of that thirst for further acquaintance with a recondite subject. Were it so, I am sure you will agree with me that teaching would not exist upon such meagre principles as "rule of thumb." We should desire to dive more into cause and effect, explain vital phenomena by scientific tests and deduction, and cease to physic by rules allied to those of the Medes and Persians.

The key to rational practice, alike in human as in veterinary science, is a comprehensive knowledge of anatomy and physiology. These branches of study may be said to be sufficiently understood by those who have no desire to see their hastily-adopted conclusions uprooted by the march of progress. But we can take exception to such a fallacious statement, and positively assert that in no department, save chemistry, are there such profound depths, such inexhaustible mines of treasure to explore; and I ask you, upon what does pathology depend for its success but upon the teachings of physiology? Where are the steps which have been taken by it, except previously trodden by the sister science, and where are they in which it does not as a young child receive the support of physiology at every instant? How would it be possible for pathology to have an existence were it not that the sister science, like a pioneer in the world of chaos, explored and smoothed the path for its progress and reception? How could the signs of disease be recognised before the tokens of health were acknowledged and appreciated? Yet, in the face of all this, there are those who recognise no aid from without, accept no stipulation as to their mode of action, and declare their department has made as much independent progress as any other, and, of course, must be adopted in accordance with arbitrary rules, and on stereotyped principles, which have only one reason for their guidance.

Columbus, when he missed an El Dorado and discovered an America, devoutly studied the quiverings of a tiny needle delicately balanced on the smallest point. That needle so called was destined to work out important results, and its quiverings spoke of those to which even the great man was not heedless. That needle united the old world with the new, and has now surrounded the "great globe itself," as it were, with a belt by which we may whisper our wants and desires to every conceivable part. The finger which had been so long held upon the lips of civilisation has been removed, the world has broken silence and exchanged affectionate greetings, and merely a needle ransacked from the bundle of confusion was the nucleus of success.

Amid all our phases of commercial prosperity the needle is forgotten. Nothing tangible is observed but the great belt; nothing acknowledged but the manifestations of good which results from its compassing the globe.

Speculative theory and scientific deduction are greatly thrown aside for the mantle of materialism, and the oft-repeated exclamations of some of our best writers who feared for the sacrifice of patient working in the present generation, is being realised. Knowledge must be concentrated and rendered sensational, or in other words, immensely popular and attractive, in order to please a fastidious and superficial generation. Religion is presented in the form of a novel or ritualistic mummery, and science, even veterinary science, must be caused to assume a parrot game for pastime. The working details and drudgery of research are to be supplanted by dogmatical theorems, the acme of "a ready-made system." Facts are too frequently unlooked for or acknowledged but in name only and statements accepted too easily, the result is too little real progress as a body, and jealous fear of individual achievements.

Such may be considered a solemn and grievous picture to draw and assert its stern application to a community. It may, however, be accepted as truth, and which may be supplemented by still greater and sterner facts. It has, however, its bright side. In contradistinction to the apathy and policy of the drones which prevail, there are spots, like the oasis in the desert, from whence springs the cry of "Give, give." Like the fairy rings on the dewy meads, or the circles on the surface of a placid lake caused by the dropping of a pebble, each by external action becomes wider and wider. Their influence, like contagion, must be communicated to surrounding objects which cumber the ground, that if unable to withstand it will die and wither from the surface, giving place to healthier and more vigorous action, and, as "the music of the spheres," will charm and mollify tumultuous spirits until the great end is attained. Great men are at work. Societies such as this are exerting a powerful influence for good in which all may share; and when we are apprised of the efforts made by those hoary in the service, each may ask himself the important question, "What am I doing towards this great work?"

Outsiders there are and ever will be to stand aloof from union upon a principle of progress. Our influence and example seldom reaches them in a direct manner. "The salt wherewith it shall be salted" fails to penetrate the centre of putrescence, which lies fouling neighbouring particles and doing irreparable injury to the constitution of the whole. It is only by exposing the rottenness within to which a corrective is applied, or the circumscribing of the decay to its own limits, that good may be expected to be accomplished. Probably the last is as good as the first, and at that stage we leave it for the subject more immediately concerning us.

The process by which food or aliment is rendered available for the purposes of the economy is usually termed "digestion," but in reality comprises several distinct stages, and as being thus made up I shall briefly consider it.

By certain movements, usually viewed as voluntary, food in its various forms is conveyed to the mouth, constituting what is understood as *prehension* and *injestion*. Greatly under the control of

the will, there is, nevertheless, also a great independence, as the acts may be observed to continue under abstract conditions of the mind with as perfect unison as if it were specially presiding over them. The communication with the sensorium chiefly occurs through the medium of the second division of the fifth or superior maxillary nerves, and the facial portion of the seventh or portio dura, guiding sensation being supplied by the former, and motor power by the latter.

The experiments of Sir Charles Bell and others with the every-day evidences of the truth of these are sufficiently well known to require further comment.

Food introduced to the cavity of the mouth, unless previously prepared, undergoes a process of reduction and saturation with fluids which effect important stages in the transforming process.

Complete reduction of food occurs by its being ultimately crushed and ground between the opposing surfaces of large and appropriate molar teeth, which in the horse are most perfect agents. Like the millstone, composed of hard and less hard portions, which admit by wear of an unequal and sharp surface being produced, the tooth of the horse finds its corresponding substances in dentine and enamel. Hard shells and husks are broken, and the interior of seeds, &c., exposed to other surrounding actions.

This process is termed *mastication*, and is purposely delayed for several reasons :

First. That through nervous influence the operation may be pleasing or grateful.

Second. That full reduction may be accomplished ; and,

Thirdly. That important preliminary chemical changes and solvent actions may be effected.

The last office is one of great importance, and but ill understood or acknowledged in many quarters.

An examination of the secretion which is so important gives the following results :

Physically, it is a watery fluid, usually colourless, possessing a slight degree of viscidity, by which globules of air are entangled in great profusion. It is known by the term saliva, and is the produce of several glands in which the parotid, submaxillary, sublingual, and buccal, are chiefly engaged. Chemically, 990 parts are made up of water, while the remaining ten are composed of solid residue, in which various salts, principally chlorides, with mucus, are present.

Closer investigation distinguishes important substances in *ptyalin* and *sulphocyanide of potassium* and *sodium*, which, although constantly present, however, vary in amount.

The density of the fluid seldom reaches higher than 1006° (except under diseased conditions, when it becomes charged with animal or mineral poisons), and is more or less alkaline. The quantity of saliva which is secreted daily is somewhat great and even surprising to those who have not proved the fact. In man it is estimated at from three to three and a half pounds by MM.

Bidder and Schmidt, while Harley states it is from one to two pounds.

From the horse Mr. Hunting obtained ten pounds during half an hour from open parotid ducts, the animal being allowed to masticate hay. Colin estimates a horse will secrete 84 lbs. and an ox 102 lbs. in the day. As a result of an injury to one parotid duct only in a bull, I have observed a fair proportion of that amount, a large manger being very quickly filled by the fluid which poured rapidly from the opening.

One other peculiarity exists in saliva. It is a mixture of several secretions from the glands named, each of which differs from the others in its degrees of viscidity, the sublingual possessing the most, the submaxillary occupying an immediate position, while that from the parotid glands is clean and watery.

The uses of saliva appear in summary as follows:

To be constant in flow, in order to lubricate the mouth, facilitate motion of the parts, and soften the food in the process of mastication.

To produce a solvent action upon sugar and all soluble principles of food.

To fit the food for safe passage along the œsophagus to the stomach.

These are mechanical uses. Among those which are to be accounted chemical may be enumerated—

The action of ptyalin upon amyloid portions of food, one part of which according to Miahle is capable of converting 2000 parts of starch into sugar.

Saliva also exerts an emulsifying influence upon oleaginous compounds, but it is admitted not to be very great.

In the peculiar compound *sulpho-cyanide of potassium* or *sodium*—there appears an effective agent, whose offices are directed principally to the destruction of fungoid spores which occasionally form between the teeth. This salt was formerly considered to be a product dependent in man upon the presence of carious teeth and practice of smoking tobacco. It is now, moreover, well known to occur independently of these states, and even exists in the saliva of the lower animals, that of the sheep in particular.

Saliva possesses, as far as is at present known, *no* effect upon albuminoid substances.

Collectively, the organs of mastication and insalivation are of great service. An arrestment of their action by reason of disease or other cause of inefficiency at once becomes evident in the conditions which follow.

Imperfectly masticated food proves indigestible, or its nutritious elements are not yielded to the system. Deficient insalivation fails to soften the aliment and prepare it for safe passage to the stomach, hence we have accumulations and often intractable choking. Being under the control of the nervous system, the supply is not unfrequently diminished in tired horses; hence care in feeding upon even necessary and good food is particularly called for. Lastly. If those important transformations which are ensured by the presence of saliva

are not carried out, we must expect an undue pressure of duties upon the resources of the stomach whereby dyspepsia usually occurs.

More of this, however, shortly.

After being subjected to the masticatory and insalivatory processes, in which the tongue and cheeks have performed no unimportant part, the food assumes a shape the counterpart of the organs through which it is to pass. Carried backwards by the tongue, whose length has now considerably diminished, but thickness increased, it reaches the isthmus of the fauces. Simultaneous with the action of the tongue the larynx and pharynx are brought forward by appropriate muscles, during which the glottis is closed by the epiglottis, and from the upper surface of the tongue backwards to the floor of the pharynx, a tolerably level and continuous surface exists. At this point the bolus of food is placed, the posterior part of the mouth enclosing it on all sides, and coating it with the viscous secretions from the numerous glands.

It is now placed within the grasp of the musculo-membranous bag—the pharynx—where it receives an additional coating, passes beyond the control of the will along the œsophagus, the viscous coat still increasing, and, at length, gains the stomach.

The process of deglutition is an involuntary act, aud ministers in no way to the process of digestion, as far as we know at present, except in the way just described.

In the *stomach* great and wonderful powers are exerted.

This organ by the action of its muscular parietes produces a continued pressure upon the contents under proper circumstances, and, in addition, motion of the contents by which their position is repeatedly changed, and brought into contact with fresh secretions, &c. Before, however, going further into the function of gastric digestion, we must first briefly notice the principal anatomical peculiarities.

The stomach of the horse is usually described as a musculo-membranous bag or dilatation of the œsophagus, the same variety and arrangement of structures being recognised with certain modifications. In the œsophagus we observe two muscular coats, one an inner oblique circular whose fibres interlace with each other, and the second an outer or longitudinal. Submucous tissue and matrix for blood-vessels and nerves rests upon the inner surface of the oblique coat, and gives attachment to the cuticular membranous lining.

In the stomach these tissues are extended. The *longitudinal* or *external muscular fibres* are caused to radiate from the œsophagus, spreading over every part of the viscus, and again becoming concentrated at the pyloric orifice.

Beneath these are *circular fibres.* These also are plentiful towards the pylorus, where they form the so-called *sphincter pylori. Oblique fibres* arise from the fundus and are distributed principally over the great curvature.

At this *cardiac* or *œsophageal entrance* to the *stomach* of the horse the cuticular membrane is continued, and lines about one half

the organ, the remainder being covered, as you are aware, by a villous or true mucous coat.

In a physiological point of view the stomach of the horse presents remarkable features. Our time, however, will not allow of their full discussion. I therefore notice them as briefly as justice will permit.

As far as the muscular fibres are concerned the greatest concentration appears at the œsophageal and duodenal orifices—the weakest in consequence of the radiation already named, at the great curvature—hence the great tendency to rupture at this point. In fact, the tissues collectively are much thinner than at any other point.

These facts decide very greatly the comparative inability on the part of the horse to vomit, resisted greatly, no doubt, by the powerful peristaltic actions which confirm the digestive powers in this animal. In a normal condition the arrangement of the lining membranes of the stomach favour their disposition towards being thrown into rugæ or folds. An outer contracting coat, like that we have already stated as existing, develops this tendency still more, and, as expected, where the greatest contraction occurs there we have the greatest number of folds, at the cardiac and pyloric orifices; the nature of the villous membrane, however, preventing the appearance being so well marked. The condition may not be inaptly represented as a large bag placed inside an elastic sac of less size, by which the larger would be thrown into puckers.

At the œsophageal entrance the cuticular folds, being numerous, are closely approximated. Pressure is exerted upon their outside, and opposing force from the contents of the stomach only serves to approximate these folds still more. These facts may be distinctly proved by taking the stomach of a horse recently slaughtered, along with the œsophagus, and filling the organ with water. Any pressure exerted upon the outside will cause the water to pass through the pylorus, but little if any will escape from the œsophagus.

Next lie the pylorus, and the experiment will be more demonstrative. Care, however, must be taken that no lesions of the muscular coat exists, or that the œsophagus is not cut off too short. The greater the length, the more decisive will be the experiment.

The stomach of a horse which has been some time dead will not answer well. As you are aware, after *rigor mortis* or death stiffening has passed away, decomposition has commenced, and the irritability of muscular fibre is no longer present, which is essential to successful demonstration. Such, then, faithfully represents in many points those conditions which are necessary to ensure vomition in the horse. They are somewhat as follows: The stomach being overloaded secretions are arrested. Food having no corrective or antiseptic, the gastric juice, rapidly undergoes the fermentive process when the favorable conditions of heat and moisture are present. The muscular coats are then stretched and eventually temporarily paralysed. By these means the inner membranes assume the size of the outer and their rugose folds are drawn aside. The passage in

the gullet is now open. Nausea in consequence of the morbid action thus instituted induces violent contraction of the abdominal muscles, anti-peristaltic action of the digestive organs, and evacuation of the contents is effected. That the stomach is passive under these states I think there can be no doubt, since vomition takes place when it is ruptured, and the contents are lodged in the omentum, and even when a bladder is substituted.

Under other circumstances, however, as in emesis brought about by the use of medicines, the stomach undoubtedly assists in the expulsion of its contents.

The isolated condition of the horse's stomach, insensibility of the animal to the effects of nauseants, presence of a cardiac sphincter, &c., are errors arising from false premises and insufficient observation. They are now totally disregarded in veterinary physiology.

Vomition, however, occurs commonly in some animals after taking their evening food, which is eaten greedily, the stomach being weakened by previous long fasting. In such cases I have noticed prior to the ejection of the food, that the œsophagus assumes a large size, and the passage upwards of a huge pellet takes place. After ascending more or less high in the gullet, which I opine is regulated by the state of the stomach and its contents, the bolus descends again and passes from the view. The duration of this phenomenon is also, I believe, dependent upon the amount of injesta. If the stomach is moderately filled it may continue a much longer period, but when the organ is impacted the nausea arising from an unnatural motion of the aliment favours immediate expulsion.

The *post-mortem* revelations in such cases demonstrate frequently dilatation of the stomach and thinning of the coats, but always more or less laceration of the muscular parietes of the lower portion of the œsophagus. From this cause the cuticular folds are drawn aside and occupy the lacerated part or the diverticulum by which a free passage is established. The regurgitation of food, then, is occasioned by the contraction of the stomach and the want of a natural closure of the œsophageal opening.

In pursuing our subject a stage further, let us bear in mind the presence of secreting cells which are placed in the mucous membrane of the stomach, the so-called gastric or peptic glands. In a section of the wall of the stomach these glands are found to be of the tubular variety, lying closely beside each other and well supplied with capillary blood-vessels on their exterior. In the human subject they are estimated at about five millions, and doubtless this is a much less number than that which exists in the horse. In form they resemble a single tube or canal which penetrates but a short depth, and afterwards divides into several glandular *cæca*. Each tube is composed of a basement membrane and cylindrical epithelium upon the inner surface, and the cæca of also a delicate basement membrane reflected over a number of globular cells containing granular matter. Between an outer layer of these cells is a narrow passage also lined by epithelium, and which serves as a conduit to

the external orifice. These glands are tolerably uniform in their distribution throughout the mucous membrane of the stomach, and appear to secrete a compound which possesses great solvent powers upon the alimentary substances introduced. The fluid is acid in reaction and holds in solution that powerfully solvent agent named *pepsin* upon which its principal power depends. This is the gastric juice.

Besides these peptic or gastric glands, there are others not unlike them in form and structure situated principally towards the pyloric orifice. Their principal points of difference are their longer tubes, shorter cæcal extremities, and absence of globular (peptic) cells. These secrete mucus only.

In addition, there are rugose folds of the mucous membrane which are distributed in a tolerably uniform manner, but considerably more numerous towards the pylorus, from which are seen to arise a number of vascular processes which greatly resemble those found in the small intestines. These are villi, but differ from those already named in containing blood-vessels instead of lacteals.

Again, there are lenticular or solitary glands to be observed in the stomach which bear a close resemblance to those observed in the ilium, of which notice will be taken shortly.

From repeated observations made upon the functions of the stomach, we are enabled to summarise them as follows:

When the organ is empty the secretion consists principally of mucus which is alkaline, but as soon as food is introduced acid gastric juice is poured forth, and the secretion continues to increase for some time after the commencement, when it arrives at the maximum.

In proportion as the aliment is absorbed or allowed to pass through the pylorus, the secretion of the gastric fluid ceases, and the membrane again assumes an alkaline reaction.

The secretion of gastric juice is not in proportion to the quantity of food introduced to the stomach, but in accordance with the requirements of the system. This is an important feature to be considered in a dietetical point of view. Food can only be digested in proportion to the amount of gastric juice poured out; therefore, when aliment is in excess portions remain in the stomach or pass into the bowels unacted upon, and these give rise to pain and irritation, inducing many symptoms characteristic of the various forms of dyspepsia.

The action of the stomach is usually described as a churning process, to which I, however, have an objection, inasmuch as the motions of the organ being regular they do not bear any resemblance to that of churning, which is violent agitation. However, if it is desirable to retain the term we must, at least, divest, in our ideas of the process, any signification of violent force, but rather look upon the whole under ordinary circumstances as regular uniform and persistent. In all the examinations which I have made in this question, that conclusion has been forced upon me as definite.

The contractions of the stomach resemble those of the œsophagus.

They commence anteriorly, and pass backwards by successive waves. Contraction in length is effected by radiating or longitudinal fibres, while diminution of calibre is brought about by the circular or transverse and oblique fibres.

During inanity the motions are slow and almost unperceived, but as soon as any aliment enters the smooth muscular fibres are stimulated and roused to action. Commencing at the œsophageal opening these contractions are excited upon the contents which are forced in peripheral or outside currents towards the duodenal or pyloric orifice, and this continues as long as undigested food, but which is capable of digestion, remains. They do not, however, obtain egress through the pylorus except as digested food in regular quantities. Before this occurs the pylorus is rigidly closed, and the currents, one going along the small curvature, and the other by the fundus and great curvature, meet at that point and are returned in a united stream along the axis of the stomach towards the œsophageal opening.

As portions become digested the pylorus relaxes and allows them to pass. Thus every portion of digestible matter is removed and indigestible portions some time retained. Subsequently, they are allowed to pass.

Here allow me to step again aside and render such facts somewhat available in practice.

My attention for some years has been devoted to a consideration of these points in reference to the light which I have presumed to believe they throw upon the treatment of an impacted stomach. Many practitioners rely in these cases upon their efforts to *relieve pain*, believing, and no doubt very correctly, to effect that, secretions which have been arrested during partial paralysis or the contractions of muscular spasm, will be usefully restored, and other functions again brought about as before. In fact, to justify one part of this routine, who has not seen the subsequent diarrhœa which sometimes follows an attack of impacted stomach or ordinary colic, when none but antispasmodic or sedative medicines, or even stimulants only have been exhibited?

On the other hand, however, the contents of the stomach under these affections are usually found rather dry, partly owing to the arrest of secretions in the organ itself, or by the natural passage in the horse of all fluids to the cæcum.*

This fact serves to show, in my opinion, a fertile cause why in some cases of colic so treated pain is *not* relieved. I have known abundance of fluid medicines poured down an animal's throat—evidences positively in favour of the stomach or bowels being greatly overloaded, and when death takes place, the contents are found to be fluid.

It appears to me that under such conditions medicines are either given too late, or, being fluid, are absorbed by the dry contents of the organs, and do not reach the parietes until insensibility comes

* In man fluids are usually taken principally from the stomach by means of the vascular villi already mentioned.

on. Aloes in solution have been found to possess in some cases no efficacy; or, when favorable results have been obtained, I could adduce as many cases of recovery which—equal in their severity to all appearances—have taken place from an administration of the drug in a solid form. This is my mode of accounting for the fact. Although the stomach is distended greatly, motion is not always entirely suspended; it is slow and retarded. Passage of the solid medicine has been traced along the lesser curvature to the pylorus, where it may be detained a short time, sometimes downwards, through the fundus and greater curvature back to the cardia. As it has passed, the drug has melted, and come into actual contact with the coats of the stomach. Several cases of impaction of the organ which terminated fatally have proved the fact in a notable manner.

By this, however, I do not wish it to be understood that I am throwing down the gauntlet and entering the lists in support of the treatment of all cases upon one stereotyped principle, and that by purgatives and injections alone. I believe there are sometimes great objections to this plan as there are to others, and prefer rather to examine carefully before rushing carelessly, anticipating, as it were, my case and also treatment.

The retention of undigested or *indigestible food, &c., in the stomach* is not without its effects upon the organ itself, and system generally.

The villous coat loses its velvety feel, and becomes dry and reddened, or pale and moist, its usual healthy appearance being frequently absent. The secretions are altered—vitiated, and, at the same time, they are considerably diminished, or even arrested altogether. The mucus is deficient. Instead of the whole of the surface being covered by a smooth, glairy coat, it presents a soft and flaccid appearance, and the papillæ as well as membrane are no longer defended from irritation. Here and there occur eruptions of sharply-pointed deep red pimples, which rise beyond the mucous membrane. These may eventually be filled with white purulent matter, and discharge their contents in the ordinary manner. Sometimes there are red patches, the result of congestion of the minute capillaries in the submucous tissue, and at others abrasions of the membranes, and even aphthous appearances. Not uncommonly there are signs of great nervous disturbance, and dry, clammy buccal membrane. When these symptoms appear with thirst and an accelerated pulse they are plain indications that perfect digestion cannot be accomplished.

Such symptoms appear in consequence of the injection of highly stimulating and corrosive agents, but occur in many diseases when prostration of the vital powers have deprived the stomach and intestines of their normal secretions and actions. Food so retained will produce the major part, if not all, these appearances, and it behoves us to make special inquiry whether in all cases of their occurrence we may ascribe their presence to a specific condition of the blood, as is, in my opinion, sometimes erroneously done with regard to cattle.

More, however, of this shortly.

In the stomach the action of the secretions are mainly confined to the transformation of azotised or albuminous compounds, while the motions of the organ itself produce a perfect commingling of all kinds of aliment, and in the end a uniform mass. It is also in a fine state of division, thickly fluid, and possesses acid properties. As you are aware, this is called *chyme*, and as such passes by degrees into the small intestines. Some parts of its constituents, however, are only in a state of fine division and mechanical suspension, others in chemical and simple solution, and more unacted upon from a variety of causes.

By the natural action of the intestines, the fluid passes along and meets in succession the *succus entericus* from the glands of Brunner, with mucous and the pancreatic and biliary secretions. Here we notice the following outline of changes in the chyme:—

1st. It is rendered alkaline.

2nd. Further reduction of albuminous matters escaping from the stomach imperfectly reduced or unchanged now takes place.

3rd. Amyloid substances unacted upon by saliva are further transformed, and sugar, generated by that fluid, is put into solution, and rapidly absorbed.

4th. Fatty substances are placed in a state of emulsion.

5th, and last. By the peculiar properties of the biliary secretion, all these compounds are so prepared that their absorption by mechanical means through the lacteals is insured, from which they pass to the blood and minister to the wants of the system.

I must content myself with this brief outline as an introduction to two or three other points which I desire to bring before the meeting.

In the first place, when speaking of the changes which are effected within the stomach, I stated that albuminous matters are chiefly acted upon, that is, chemically.

This change consists in the production of compounds belonging to the type of substances called peptones, parapeptones, metapeptones, and dyspeptones. These have received the attention of scientific men, and pronounced to be albuminous substances in successive stages of transformation.* Peptone is usually considered the higher form of albumen, while parapeptone is the lowest. The former has suffered such change as will admit of its ready absorption. It is in fact, in a readily assimilable form. Parapeptone, on the other hand, requires the aid of the intestinal and pancreatic secretion for its elevation into peptone before it can be assimilated. In its primary state absorption is not so readily effected. It is unlike the necessary albumen of the blood, and if it gains access to the circulation, proves a foreign body, and must be expelled.

The emunctory by which it is discharged is the urinary apparatus, and the form in which it is found is metalbumen. Such urine is generally dark coloured; in fact, possesses the various shades, up

* Doubtless the presence of oxygen carried down by the saliva in its little bells may minister towards this oxidation; hence an important reason why food should be well masticated.

to almost a black. It is thick and viscid, like mucilage or linseed oil, and possesses a high density, not unfrequently reaching 1050. Blood material, with carbonate of lime in excess, are also present; and chemical tests disclose that, although albumen is present, its chemical constitution appearing in nowise changed, yet its behaviour is considerably altered, and on that account may be frequently overlooked.

The origin appears to be owing to a faulty assimilation occurring in highly fed idle horses, and consists in the presence of an excess of nitrogenous material in the blood, the greater part of which is of a low constitution, unnatural to it, and incapable of being converted into the requisite tissues of the body.

That part of the alimentary canal which we term the intestines is possessed of a great amount of motion upon itself, so that when describing the different regions of the abdomen, and the parts of the tube usually found there, this reservation is always made. In consequence of this we find portions considerably removed from their natural position, sometimes it may be without inconvenience, but at others serious consequences occur. As instances of removal without inconvenience I may mention, that I have frequently found the cæcum occupying the pelvis. It has also been observed beneath the transverse colon and the small intestines occupying a position immediately beneath the wall of the abdomen. I speak of the carcase when placed in the first position for dissection. Without going into the different forms of hernia or intussusception, I may briefly state that the peristaltic motions of the intestines greatly favour their removal to abnormal positions independently upon violent action on the part of the animal. The nature and quantity of their contents also have some influence in regulating them, added to which is pressure from the diaphragm and abdominal walls. In some of these states where death occurs, we find certain conditions which will not be uninteresting to us for consideration. They are usually ascribed to inflammation. Certain black or deep red patches, or extensive discoloration, are often observed in different parts of the intestines beneath the peritoneum. At others there is a great quantity of fluid, red serum, and the whole of the organs in contact with it are of a bright red colour.

Mr. Anderson will describe to you cases where he found the omentum black and thickened, and which he says might be readily mistaken for the spleen under a state of aggravated congestion. Such are not without great significance, and in my opinion point to anatomical as well as purely physiological facts.

That these are *not* due to inflammation I consider we have ready proof. There is no thickening of the intestinal walls, no plastic effusion, no flakes of lymph in the serum, or seldom traces of false membrane after death. The latter, however, may occur locally, and produce the union of parts, but I cannot see my way clear to pronounce upon the existence of so many cases of enteritis, as we are occasionally informed do occur, are treated, and recover.

I always regard these in a most doubtful light, for cases to my

knowledge which have been decided as of that nature, and in which extreme measures were advocated, have recovered without any other than the ordinary treatment already adopted with a little forbearance. The whole train of *post-mortem* appearances are due to *unequal* or *diffused pressure* resulting from the physiological actions named. The black patches or ecchymoses are the results of hyperæmia of the minute blood-vessels of the intervening tissues *localised* by pressure. The effusion of red serum to a similar cause, preventing a return of blood either by the portal vein, vena cava, or vena azygos, or all of them. The reddening of the tissues are merely blood-stains in consequence of the colouring matter of the blood, which, as we are taught, is soluble in water, being conveyed with the serum.

This is termed hypostatic congestion, and is found always to be *more general than inflammation.*

Trousseau and Rigot found that, by hanging dogs after strangulation in a vertical position, head or heels upwards, produced those appearances which were always confined to the lowest part of the abdominal viscera.

Rokitansky speaks of inflammation of the tissues—except local or catarrhal, or caused by irritants, poisons, &c., being rare indeed. Other writers confirm his views, and look upon inflammation as generally circumscribed, producing a red vascular wreath or halo, but not as black patches.

The appearances which Mr. Anderson has seen may occur also from those conditions in which local pressure is brought about, and venous circulation impeded. If the lungs are congested, the affair is always increased in severity, but the obstruction in either part of the body will produce that small rapid pulse and anxious countenance, with other symptoms betokening dissolution, which are erroneously looked upon as evidences of inflammation. There is this difference, however, the terminations of true inflammation are *not* so rapidly fatal.

With regard to these cases there is one question which presents itself to me with great force. It is this :—If we have so many so-called cases of enteritis in the horse, which I am very doubtful about, how does it happen that they prove more rapidly fatal among tissues *secondary* to the purpose of life, while organs like the lungs, which are of vast primary importance, can endure the effect of pure inflammation for a week or ten days, and in the majority of cases recovery follows.

There is something for our consideration here.

In turning our attention to the internal tunic of the intestines, we find under certain conditions the existence of those aphthous crusts and removal of the mucous membrane, inflammatory intumescence, either punctiform or diffused, as in the wreath or halo. In the small intestines as well as the colon also there are evidences of the agminated and solitary glands being enlarged, and otherwise undergoing change.

In stating the appearance sometimes of certain of these conditions in the stomach, I remarked how important it is that we should be able to identify them, and not confound their existence with diseases depending upon specific blood poison in the form of *a* fever. It is now generally known such are *not present only in fevers*, but in other affections not at all of specific or contagious characters.

In gastritis mucosa, in enteritis mucosa, or catarrhal inflammation of the mucous membrane of the intestinal track, all or part of these appearances may be present.

Enlargement of the agminated and solitary glands was strongly insisted upon in 1865-66 as specially belonging to the Cattle Plague. They have, however, been found in other non-contagious diseases, as diarrhœa and dysentery. I have frequently found these conditions along with abrasions of the mucous membrane entering upon the ulcerous stage in sheep dying from the effects of *strongylus filaria*, and similar conditions are to be found in coryza gangrenosa of the horse and ox, pleuro-pneumonia of cattle, and enteric fever of the pig, &c. Mr. Erskine and Mr. Anderson will be able to inform you that the exact appearances presented in rinderpest have been seen by them in horses which recently died from the effects of very inferior provender.

The enlargement of the solitary glands of the large and small intestines, as well as their aggregations which constitute the so-called Peyer's patches, are evidently due to conditions which are favored by their anatomical peculiarities. They are entirely unlike the ordinary glands of Brunner or Lieberkuhn. They are not involutions of mucous membrane, possess no epithelial lining, and are destitute of the follicular character. On the other hand, they are solid aggregations of nuclear particles imbedded in an intervening granular matter, the whole enclosed—according to Brucke, Kölliker, and others—in a capsule composed of indistinctly fibrillated connective tissue with nuclei. Outside of this capsule a close vascular network exists, from which capillary vessels freely pass into the midst of the contents, and return by loops.

What their physiology is we are not exactly informed, but doubtless they may have some elaborative power upon the assimilated alimentary matter. However, of this we are certain, from a careful examination of those peculiarities, that there exists ample means for the appearances already named when subjected to any morbid process. Their structure renders them peculiarly liable to become prominent, and, not being secreting glands, they have no outlet by which to discharge excess of material in the shape of secretion. On the contrary, the nuclei which are contained within them are constantly creating fresh additions of plasma and development of cells, and this appears to be the whole secret of the *modus operandi*.

The Peyerian patches are more largely developed in some animals than in others, but, as a rule, any cause which brings about irritation in the parts where they are situated will also succeed in causing the conditions which, as already stated, have afforded so much room for speculation.

There is yet one other physiological peculiarity which I must beg to include, even if the notice be brief. It is connected with the intestinal villi, and by which we can understand more fully the process of absorption from the digestive cavity, not only of fluid but even solid particles.

Each villus forms one of the most unique and wonderful organs which it is our privilege to investigate, in connection with the animal body. It is also as delicate as wonderful, while its functions call for attention no less intense.

The investigation of these bodies was carried on with great perseverance by a man who most here can say was associated with their student days. I refer to the late John Goodsir. His name will give increased interest to the subject we are considering. Since then, the attention of continental physiologists have been attracted to these villi, among whom are Brucke, Heidenhain, Gruby, Delafond, Funke, and Kölliker. The sum of their researches is that each villus is made up of a central lacteal with capillary blood-vessels surrounding it. Beneath the mucous membrane is a layer of smooth muscular fibres with nuclei, which appears to be for the purpose of contracting the length of the organ, and regulating the movement of chyle within the interior.

At one time the lacteal within was believed to terminate in a cæcal extremity, and afford no direct communication with the intestine. Now, however, there appears sufficient reason to believe that the surface of the membrane is covered with cylindroid epithelium, whose free extremities are mounted by hollow tubes or cilia according to some, or otherwise they are patent, or closed only by a thin septum. The former, however, is the most generally received idea, and upon this arrangement has been decided the cause of solid and insoluble particles of matter, such as finely-divided charcoal, sulphur or starch gaining access to the blood of the mesenteric veins.

There is, however, little doubt that solid particles gain access to the system through the epithelial cells of the villi, according to observations which have been made, and, further, we may trace through this channel a medium for the passage of some of those minute ova of parasites which infest different parts of the body, whose migration and nature we may possibly know more of shortly, as Klebbs has distinctly witnessed psorosperms in their interior.

For a more accurate description of the parts referred to throughout the paper, I must refer you to the diagrams which shall be noticed at the conclusion.

The last subject to which I will solicit your attention in connection with the organs of digestion is that of diarrhœa.

Under certain states this condition becomes intractable, and not at all amenable to the actions of medicines; notwithstanding all that may be done, the animal sinks in consequence of the continued drain upon the system. From various causes the blood may be poisoned, or the irritation set up by drugs, or metastasis, the bowels become the outlet by which the foreign body is eliminated. Excess of either promotes a continuous action of excretion, and the favorable

condition of the organs facilitate this to a remarkable degree. Discharge from the surface becomes excessive. The glands are surcharged with blood, which serves to maintain the excitement, and it is at this time that medicines have no effect, seeing that they can seldom be absorbed, but on the contrary as often act as fresh means of irritation under a disordered state. It therefore has become a settled fact, that during excessive secretion within any organ, absorption cannot take place, or but to a very limited amount. In this way woorara poison has been introduced into the parotid gland during active secretion, but no effect was evident. On the other hand, however, during inaction, its effects were completely manifest, absorption being instantly active.

These conditions have been explained by the laws of osmosis, or the passage of fluids through septa of different kinds. Professor Graham has, I think, definitely answered the question by his determination of the fact, that the passage of fluids greatly depends upon the nature of the substances which they hold in solution, and also the membrane through which they are to pass.

In intractable diarrhœa or dysentery we have not only the constitution of the blood undoubtedly very much altered, and likewise structure of the membranes of the actively secreting follicles of the intestines, but frequently the food is very imperfectly assimilated, together with a loss of the biliary secretion, which is the chief agent in absorption. Their condition is the reverse of health, and hence fluids of opposite tendencies are no longer capable of permeating the membranes, but tend rather to promote a passage towards themselves; that is, in a contrary direction. A disturbance such as that already alluded to must necessarily alter the condition of the tissues, and under the laws which direct the movement of currents according to their affinities for the membrane, as well as relative density, we have therefore insurmountable difficulties to encounter. As far as the physiologist has yet penetrated the arcana of nature, he has not been able to solve the question of a remedy for this. The pathologist must therefore wait; and if he has not already succumbed on other points, he will at least have no other alternative in this instance but to do so patiently until the sister science grants him permission to advance. Without her he can do nothing, but with her advice and assistance his labours become easy and pleasurable, as well as a blessing to the human and animal races.

It only remains to be stated, that in the foregoing remarks are embodied but a very small portion of the evidences and points which may be adduced on the physiology of digestion in relation to pathology. There has been no attempt to exhaust an endless subject. If the Association is willing to accept the paper as an instalment, and circumstances permit, other parts may from time to time be taken up, and their merits likewise afford an inducement for consideration at future meetings."

LETTER FROM MISS DICK RELATIVE TO MR. ERNES' REMARKS AT THE ANNUAL MEETING.

BURNTISLAND, FIFE; *June 6th*, 1868.

SIR,—I beg the insertion of the following in the next number of the *Veterinarian*. In looking over this month's number I find the report of a speech of Mr. Ernes, from which, as it appears to me, he knows little of the former doings, either of the London or Edinburgh Veterinary Colleges, when he speaks of the "shortness of the Sessions."

My late brother, Professor Dick, passed indeed a short session at the London Veterinary College, being admitted a pupil in October, 1817, and receiving his diploma in January, 1818. I have the diploma.

It is signed by—

EDW. COLEMAN, *Professor*.	J. COOKE, M.D.,	*Examiners*.
W. SEWELL, *Treasurer*.	GEORGE PEARSON, M.D.	

I am, &c.,

(Signed) M. DICK.

To the Editors of the 'Veterinarian.'

PARLIAMENTARY PROCEEDINGS.

THURSDAY, JUNE 18*th*.

INTERNATIONAL VETERINARY CONGRESS AND THE CATTLE PLAGUE.

Sir J. C. Jervoise asked the Vice-President of the Committee of Council of Education whether he was aware that a paragraph in the *Times* of the 7th of September, 1867, announced that the International Veterinary Congress held at Zurich "determined to request the Russian government to appoint an international commission to consider the possibility of arresting the cattle plague in its place of origin, the steppes of Russia;" whether that determination was carried out, and with what success; and, whether the report of the resolutions come to by the congress would be distributed.

Lord R. Montagu was not aware of the appearance of such a paragraph. The matter, however, was one which did not come under the cognisance of his office, but of the Foreign Office.

THE IMPORTATION OF FOREIGN CATTLE.

In answer to a question from Mr. Horsfall,

Lord R. Montagu said that unless the cattle plague should reappear, the Order in Council relating to the Importation of Spanish, Portuguese, and French cattle would be extended until the meeting of the new Parliament.

JUNE 22*nd*.

INTERNATIONAL VETERINARY CONGRESS AND THE CATTLE PLAGUE.

Sir J. C. Jervoise asked the Secretary of State for Foreign Affairs whether he was aware that a paragraph in the *Times* of the 7th of September, 1867, announced that the International Veterinary Congress held at Zurich "determined to request the Russian

Government to appoint an international commission to consider the possibility of arresting the cattle plague in its place of origin, the steppes of Russia; whether the statement was correct; whether this determination was carried out, and with what success; and whether the report of the resolutions come to by the congress would be distributed.

Lord Stanley was afraid he could not give the hon. baronet the information he required. He had seen the account referred to, and he was aware that the International Veterinary Congress did meet at Zurich, but no report of that congress had reached the Foreign Office, and he was unable to say whether such representations had been made to the Russian Government.

IMPORTATION OF FOREIGN CATTLE.

Mr. Headlam gave notice that on going into committee of supply on an early day he would move—"That it was the opinion of the house that it was expedient that the powers vested in the Privy Council for preventing the importation of foreign cattle from any place where the disease was supposed to exist, but subject to the exercise of such powers, that the same rule should be laid down as to the importation of foreign cattle as existed in France."

METROPOLITAN FOREIGN CATTLE MARKET BILL.

This bill came on for discussion at a morning sitting, June 26th. The measure was strongly opposed by many members, and as warmly supported by others. *Mr. M. Gibson* moved the following amendment:

"That the proposal to pass a permanent law requiring that, in order to prevent the introduction of the cattle plague into this country from abroad, all foreign cattle and other animals imported into the port of London shall be landed at one prescribed spot, and shall not be removed thence alive, ought not to be considered apart from the general policy of imposing legal restrictions on the foreign cattle trade in other ports of the United Kingdom."

The adjournment of the debate was moved by *Mr. Headlam.*

In reply to a question put by Col. Bartellot, *Mr. Disraeli* promised to put the bill on the paper for Monday, June 29th, not with the expectation that it would come on, but in order to allow time for an arrangement to be made.

ARMY APPOINTMENTS.

War Office, Pall-Mall; *June 2nd.*

Veterinary Department.—To be Acting Veterinary Surgeons: Michael Joseph Hartigan, Gent., *vice* Phillips, promoted; Frederick William Going, Gent., *vice* Edmonds, promoted; John Bunnell, Gent., *vice* Ewing promoted; John Hammond, Gent., *vice* Poyser, promoted.

June 19th.

Veterinary Department.—19*th Hussars.*—Veterinary Surgeon Charles Barrow to be Veterinary Surgeon, *vice* Anderson, deceased. James Henry Lemon, Gent., to be acting Veterinary Surgeon.

THE

VETERINARIAN.

VOL. XLI. No. 488. AUGUST, 1868. Fourth Series. No. 164.

Communications and Cases.

AFRICAN CATTLE AND THEIR PARASITES.

If proof were needed that commercial enterprise is rapidly extending the sphere of its operations for the purpose of supplying this country with animal food, we have it in the fact that during the past month a cargo of cattle has been imported into the metropolis from Morocco. No doubt great danger is run of bringing in diseases which are practically unknown to us and also of new parasites by the importation of cattle from such distant lands, and the whole matter therefore requires to be well watched by the government. It is true that such proceedings are more or less of a speculative character, and that they will not be persisted in unless found to be remunerative. The thing, however, has to be tried, and these first trials may be fraught with much mischief to the wellbeing of our native cattle. So far as the present importation is concerned, we have good reasons for believing that it has proved a very unprofitable speculation, and that no harm has arisen, or is likely to arise from the introduction of any special disease. The experience gained, however, will no doubt lead to the avoidance of the causes of loss for the future, and hence further attempts at these and allied importations are likely to be made.

The animals in question, 338 in number, left Tangier on the 24th June, at about midnight, and arrived at the Victoria Docks on the morning of July 2nd. The passage was a good one, and was attended with the loss of only one animal on board the vessel. Many of the cattle are said to have travelled upwards of 300 miles to reach the port of Tangier;

and when this circumstance, and the nearly eight full days' confinement on board are considered, it is remarkable that they showed so little fatigue on their debarkation. They were seen by us at that time, and also from day to day until they were sold in the Metropolitan Cattle Market on July 6th. Many of them were even followed to the slaughter-houses, and a close inspection made of their viscera.

Although perfectly free from constitutional disease, they were nevertheless much emaciated. Epizoa were also present in great abundance on many parts of their bodies. The parasites mainly consisted of two varieties of the so-called "tick," *Ixodes Ricinus*, and *plumbeus*, among which, however, we met with many specimens of the *Ixodes rubidus*. These epizoa were congregated together in places where their protection from harm was best secured; thus, they were principally located on the lower parts of the neck and dewlap, between the fore-legs, behind the elbows, on the inner side of the thighs, upon the scrotum, along the perineum, and around the anus. They varied in size, from that of the head of a pin to the end of the little finger, and it was a singular circumstance that the parent tick was found to be mostly overlying or covering two or three young ones. The skin in these parts was inflamed and covered with minute scabs.

Besides ticks, these cattle brought with them a variety of the "forest fly"—*Hippobosca*. This fly, as is well known, will often accompany horses on a journey for many miles together, running over the body and inflicting severe bites from time to time. In districts where it abounds, it is often the cause of accidents both to horse and rider. Notwithstanding this habit of the fly, it would scarcely have been supposed that it would have travelled from Africa, and not have quited its victims until they were slaughtered in the abattoirs of the metropolitan market. Such, however, was the case, and we saw many of them still running over the detached hides.

Hippoboscites belong to that variety of the *Diptera* which is *pupiparous*. The early stages of development are passed within the body of the parent, the *pupa* being brought forth when nearly perfected. From the *pupa* the *imago* soon escapes. Through the kindness of Mr. Rayment, Inspector of the Metropolitan Market, we have been able to procure both expelled pupæ and flies big with developing pupæ. Whether this variety of the *Hippobosca* is already resident in this country we are not able to state, but if not, there is now at all events a great risk of its being naturalized here.

Another interesting circumstance remains to be mentioned with regard to these cattle, namely, that on examining

their mouths, in consequence of the lips of many of them being bloody, *leeches* were found to be adhering to their gums and inner side of the lower lip. These creatures existed in twos and threes in general, but in many of the animals a greater number were present. Leeches abound in ditches and pools in Morocco, and no doubt the animals had taken them in while drinking at these places on their way down to Tangier. A search was made for any which might have been swallowed, but in every instance without success.

We close these remarks by quoting some observations which were published by us on *ticks* about four years since, in the 'Journal of the Royal Agricultural Society.'

"*Ixodes Ricinus*.—The Tick.

"The tick is a true blood-sucking parasite, belonging to the family *Ixodida*, the class *Arachnida*, and order *Acarina*. The species or varieties are very numerous, both here and in most other countries.

"Although ticks are met with upon every variety of domesticated animal, as well as upon several wild ones, still the *Ixodes Ricinus*, dog-tick, the *Ixodes rubidus* and the *Ixodes plumbeus* —sheep and cattle ticks—are best known in this country.

"These parasites exist in most localities, but they especially abound in light, sandy, and warm districts, where brushwood, thickets, and plantations prevail. In such situations they remain secure from injury, and comparatively at rest during the intervals which elapse between the times of their obtaining a full supply of blood from the animals they attack. Prompted by hunger, however, the tick becomes more active, and will then fasten itself upon almost any animal which may come in its way. To effect this it plunges its rostrum—sucking proboscis—deeply into the skin, and thus fixed it will hang on for days together sucking the blood, until its body becomes distended to eight or ten times the original size. When filled to repletion it quits its hold, and again seeks the security of its hiding-places.

"It is by no means an unfrequent occurrence for horses in such localities, while at exercise at early morn in summer, to be attacked by ticks, and consequently to return to the stables with several of the parasites upon their legs. Besides animals, ticks will frequently attack birds, and they have been also known to occasionally fix themselves on man to obtain a supply of blood. It is, however, only in very rare instances, and these chiefly in dogs, that ticks exist in sufficient numbers to give rise to much irritation or suffering. Dogs taken out for sporting will often return with a large number of

them fixed to their skin. This is especially the case with dogs used for rabbit-catching in the autumnal period of the year, more particularly when warm weather prevails. Ferrets, also, which are employed to drive the rabbits from their burrows, will be attacked in a similar manner. Rabbits when killed are frequently found to have several of the parasites upon them; and so also, but more rarely, are hares. Not only is this the case, but weasels and stoats are so generally affected with ticks, most of which are so small and young, that some persons have supposed that the parasites are originally bred upon these and similar wild carnivora by the parent tick depositing its ova on different parts of their bodies. It is a somewhat singular circumstance that ticks, which do not seem as a rule to show any preference for one part of the body over another, are said to congregate inside the ears and between the toes of weasels and stoats. It is supposed by some that these places are selected by the young ticks, as the animals cannot easily dislodge them from thence; while by others it is thought that the ova of the parent tick were deposited in these sites.

"A few years since we met with a large number of young ticks adhering to the head and face of a horse sent to the College for examination as to soundness. The animal had been forwarded from the country to a gentleman in town a few days before, and the parasites had not been detected until seen by ourselves, probably in consequence of their small size and brown hue, which pretty nearly approached the colour of the horse. We were enabled to obtain many specimens with their rostrum—sucking proboscis—entire, always a difficult thing to effect, in consequence of the peculiarity of its formation and its firm insertion in the skin.

"We here insert an illustration of one of these ticks,

Ixodes Ricinus. Magnified.

drawn on an enlarged scale from a specimen still in our possession. (See Fig.)

"The chief points of interest in the structure of the tick are well represented in the preceding illustration. The barbed or serrated rostrum, by means of which, as the barbs point backwards, the parasite is enabled, almost without muscular effort, to retain its hold of the skin, is clearly depicted. The externally barbed rostrum is found to sheath the mandibles, two in number. These are three-jointed, 'the basal joint being internal, the second external and long, and the third short and denticulate.'* The palpi, situated close to the rostrum, one on either side, are broad and large, and in some specimens would seem from their near approximation to the rostrum to be capable of embracing it. The abdomen, or body of the parasite, is formed of an exceedingly extensile membrane, whereby the creature is enabled to receive, without inconvenience, a large quantity of blood into its digestive system to be husbanded for its future wants. The legs are eight in number, and are attached to the under part of the body at its anterior half, having their places of attachment very near each other. They are of nearly equal size and length, and are furnished with seven joints. At their free extremities they are tipped with two recurved hooks, having a fan-like expansion of membrane between them. On the back of the creature, immediately behind the palpi, a cuticular shield-like plate, much darker in colour than the rest of the skin, is placed evidently to give strength to this part of the frame. On the under surface of the abdomen, just behind the last pair of legs, a circular-shaped respiratory organ exists on either side; and a little further backwards a similarly-shaped body centrally placed, having a slit in its middle, is also present. The latter named opening is the excretory outlet to both the digestive and reproductive systems. (See Fig.)

"Although, as has been stated, these parasites are comparatively harmless in this country, still, in many parts of South America they attack animals in such great numbers as to give rise to serious consequences, and often indeed to cause death. At a meeting of the Microscopical Society in 1842, Professor Busk exhibited some *living* ticks which had been sent him from Rio Janeiro as specimens of the parasite, called by the Brazilians the *Carapato*, which had been from sixty to seventy days on their passage. At a subsequent meeting of the same Society, Mr. Busk read an interesting

* 'Micrographic Dictionary,' Article "*Ixodes*."

Paper, containing much practical information, on the subject, from which we make the following extracts:—

"'1. The name of *Carpato* or *Carapat* is given to the insect, in consequence of its resemblance to the seed of the *Ricinus*, which has that name in Portuguese.

"'2. It is common in all parts of South America, where cattle abound.

"'3. It infests cattle, horses, dogs, and sheep.

"'4. It is not found on plants; and cattle generally become infested with it when feeding in open and exposed pastures, where the sun's heat is great; and it increases most in dry seasons. It is generally supposed that the insect was not seen in the Brazils previously to an excessively hot and dry summer about 1824 or 1825, since which it has multiplied amazingly. It is remarkable that cattle feeding in shady pastures and coppices are frequently quite free from the carpato, but will acquire it by infection from others.

"'5. The mode in which it appears to cause destruction to the animal infested by it, is by the incessant irritation which prevents the animal feeding or resting, and in consequence it becomes worn out.

"'6. They first appear on those parts of the skin uncovered by hair, and are then not larger than a pin's head, but make the part quite black by their numbers. They adhere so closely that scraping them off would tear up the skin. In a short time they increase to the size of a bean, or common tick, as seen in dogs, and fix themselves promiscuously on all parts of the hide where covered with hair.

"'7. The same species appears to insinuate itself, in its incipient state, upon the human body; but is not known to assume the tick form there. They adhere tenaciously to the skin, and are believed to introduce themselves below it. They are very harassing, and even create soreness and inflammation. They generally affect persons who have been passing through woods, but are not known to be ever seen or found on trees or plants.

"'8. Many thousand head of cattle are annually carried off by the carpatoes, and frequently a scarcity is thus caused.'"*

"The means at our disposal for getting rid of ticks are simple and efficacious. They should not, however, be pulled off, unless existing in twos or threes, for by such means the rostrum will be left fixed in the skin, and may give rise to untoward results. Mr. Blaine, in his 'Canine Pathology,' recommends that the parasites be clipped asunder with a pair of scissors, when they will, he says, immediately retract their sucking organ and fall off.

"Sponging the skin with a decoction of tobacco, saturated with salt, will generally cause them to quit their hold. A mixture also of linseed-oil and creasote, made with one oz. of the latter to four of the former, rubbed in with the point of the finger around the part where the ticks are placed, will be effectual for their removal. They are likewise very easily destroyed by touching them with oil of turpentine, but it generally happens that they still retain their hold; this,

* 'Microscopical Transactions,' vol. i, p. 88.

however, is a matter of little importance, because after death they can readily be detached by the slightest friction, and will then be found to come away entire."

ON TRICHINOSIS AND MEASLES IN SWINE.

By F. Wohlthat, Veterinary Surgeon, Magdeburg, Prussia.

He who has conversed with the general public on the above subject will have been fully convinced that by many, even educated, people a far from correct view of the matter is held, owing chiefly to the relatively little and insufficient explanation which has been given of it in the public papers. To remedy this fault in some measure, and to protect persons against injury is the object of the following communication.

The *Trichina spiralis* is a very small worm, met with in the muscles, *i. e.*, in the flesh, and in the stomach and intestines of man and many animals. "Muscle-trichina," or intestinal trichina are names given to the parasite according to its situation. The former when full grown is about the size of the fine point of a sewing-needle broken off short. It cannot be seen by the naked eye or by the help of a common lens in unprepared flesh. It encloses itself in a capsule, and therein preserves its vitality for a long space of time, according to some observers even as long as twenty-four years. In the course of four to six years the capsule, by calcination, becomes opaque. If "muscle-trichinæ," it matters not whether in or out of their capsules, reach the stomach and bowels uninjured, as in the case of man eating trichinized pork, either raw or insufficiently cooked, or of swine devouring trichinized mice or rats, they become, in the space of three to five days, transformed into "intestinal trichinæ." A fully developed intestinal trichina is about as long as the width of a flatly-pressed straw, and as thick as a fibre of linen. It is visible to the naked eye if placed in a drop of clear water on a piece of glass, but its sex cannot be determined without the aid of a powerful lens. The female, which is larger than the male, brings forth her young alive in large numbers, and is afterwards voided with the excrement. *The young trichinæ are conveyed most probably by the lymphatic vessels of the intestines into the blood, and then by it into the muscles of various parts of the body,* where they are developed as muscle-trichinæ. Later on they become encysted.

Many medical men, even of great reputation, treat the ques-

tion—how do the trichinæ get into the muscles?—very inconsiderately, by roundly asserting that the young of the intestinal-trichinæ bore through the coats of the bowels, and migrate into the muscles, albeit these worms, like many other kinds, are not furnished with any boring apparatus or organ. It is scarcely credible that experts should lend themselves to such a statement, for the impossibility of this sort of wandering is quite evident on reflection. The moving from place to place, *i. e.*, the creeping about of full-grown muscle-trichinæ is so very slight that one may scarcely speak of it. The minuteness alone of the creature—just consider its natural size—does not admit of the long journey from the stomach or bowels over many convolutions of the latter to the abdominal wall, and from thence, if it is to traverse the fore and upper parts of the body, along the wall of the chest to the shoulder, which presents a difficult pass, and thence over many other difficult passes to the muscles of the fingers' points. An ordinary life—indeed, a Methuselah's—would not suffice for the performance of such a journey, which the sportsman, to be sure, would not call a flat race, but a race over most uneven ground with unremovable impediments. The favorite modern term "wandering" is, therefore, quite unsuitable, and the old term "spreading," long used in the cases of other worms, *e. g.*, Cœnurus, Filaria, Distoma, &c., is much more appropriate.

The Cysticercus Cellulosæ—Measles in the Pig.—Besides "trichinæ" we often find in swine the cysticercus cellulosæ. These entozoa, in their full-grown state, are about the size of but not so flat as a small lens. They become hard—cartilaginous—with age, are met with in the muscles and the areolar and adipose tissue. They are well-known to butchers, and, indeed, to all persons who have once seen them.

Provided the cysticerci reach the human stomach uninjured they develope, except in subjects of especially strong digestion, into a peculiar form of tapeworm. If the ripened segments of worms (*Proglottides*) become conveyed into the stomach and intestines of the pig, for which opportunity is afforded by the animals being at large, there result the already described "measles." The diffusion of the embryos through the body is effected through the *lymphatics, and blood circulation* as in the case of the trichinæ.

Mankind may be protected against the measle tapeworm and trichinosis—1st. By examination. This with cysticerci is quite simple; with trichina, on the contrary, it can only be effected with the aid of a good microscope. Let one take some

pieces of flesh about the size of a hazel nut from the fore, middle, and hinder parts of a pig, as cut up for sale, and make from each piece four to six preparations, and view them carefully fibre by fibre, when magnified about seventy diameters, and he will be enabled to pronounce positively as to the presence or absence of trichinæ.

2nd. By preparation, cooking, &c. If flesh affected with trichinæ or cysticerci is thoroughly cooked, pickled, or smoked, it is then perfectly innocuous. The same holds good of all fatty matters that are melted out, and, therefore, of lard and scraps; but the fat of roast meat, so long as it exists as such, and not as crackling, is not always harmless. There is much shortcoming on the part of our cooks and melters with reference to the complete carrying out of these precautions. The art and the way, and their final object—the thorough cooking—are too little regarded. It is not, to wit, a matter of indifference whether the meat is set over the fire in cold or in hot water. In the first case, the thickest piece will cook thoroughly to its centre, but in the second, on the contrary, the hot water so quickly coagulates the albumen of the outer surface of the flesh that the penetration of water and heat is greatly obstructed, and the meat in its centre becomes only partly done. This takes place in nearly all our boiled sausages. They are sufficiently cooked in most cases only immediately under the skin, and, therefore, we need not wonder that they so often produce mischief. The so-called "Hallischer liver" sausage and all thick red sausages are scarcely made hot, to say nothing of being boiled, in their middle. This is especially the case when sausages from several pigs are boiled in one vessel. It can be easily proved by cutting a thick sausage through immediately it is taken out of the boiler, and applying a thermometer to the middle of it.

In cooking with fat the case is this: The favorite fried sausage dumpling is never done inwardly when cooked in fat that is already boiling. Fully cooked meat, whether roasted, boiled, or stewed, loses its redness, and is certainly then harmless. We have, therefore, in the appearance of the meat a simple and reliable sign which, however, must not be confined to its outside, but must extend to its very centre. Red-looking meat, boiled or roasted, is not thoroughly cooked, and may harbour both live trichinæ and cysticerci. The same by the way holds good with respect to red-looking, only partly cooked liver, in which are often many parasites, which if conveyed alive into the human body produce not merely tedious but absolutely incurable and fatal diseases. Smoking

and pickling are a sure protection against infection if properly carried out. Salt dissolved in seventy parts of water kills the trichinæ within a few minutes. Flesh is perfectly smoked or pickled only when a part taken out of its middle tastes decidedly smoky or salt. This takes place in a shorter or longer time according to the thickness of the parts. It is effected, however, in extreme cases, and in the thickest portions of flesh within six weeks. Pickled and smoked meats which have not been examined ought not to be eaten earlier than this.

In conclusion, a few remarks upon the legal decisions and preventions respecting our subject. With regard to the first, there is no doubt that trichinæ and measled swine are returnable to the seller, even if the purchaser has bought them without a warranty against trichinæ or cysticerci, or any other fault, but particularly if he has bought them with the stipulation, tacit or expressed, that they are sound and good,—provided the disease in question existed at the time of sale, and had not arisen subsequently thereto. It is to be regretted that the period of incubation (Entstchungs-dauer), important as it is to veterinary jurisprudence, has not been experimentally determined. From some observations which have been made, it is assumed that swine with trichinæ in opaque capsules have been trichinized for six years, in semi-opaque for four years, in transparent for two years, and in capsules just forming for one year; with full grown trichinæ for three weeks, with partially grown for ten days; that swine with cysticerci fully grown have harboured them for three months, with those of middle size for two months, and with those only forming, appearing to the naked eye as being about the size of a pin's head, for one month.

If in the 'General Common Law,' part i, section 11, paragraph 204, the duration of the warranty is fixed at eight days, it had its foundation in insufficient knowledge of the matter at the time of that determination. According to the present state of science, this period is far too short, as shown by the above statements. Paragraph 204 is for many cases quite out of date, and paragraph 203 takes its place—according to the judgment of experts. However, since judgment among various experts sometimes differs, it is greatly to be desired that the various stages of measle-development should be accurately determined by experiment, and unanimity thereby arrived at. No special instructions are given in the common law regarding the consumption of trichinized and measled flesh by the people, but these undoubtedly follow from those of other and similar con-

ditions, according to which and conformably to the present state of knowledge, such flesh must be deemed as diseased, because under ordinary circumstances it can occasion disease and death in man. No one is allowed to represent such flesh as harmless, or sell it as sound and good in Prussia under a penalty of five to fifty thalers and other punishments. But as such flesh under special circumstances, *i. e.*, by such careful method of preparation that the parasites are effectually destroyed, is harmless, if not quite relishable, the private man is not forbidden the use of the same for his own consumption. To tradesmen, *viz.*, butchers and boilers, this is not permitted because of the evident difficulty in controlling the preparation and decoloration. In their case, the flesh is confiscated, and to prevent any abuse of the law it is, in conformity with the new public instructions, sliced and thoroughly saturated with stinking animal oil whereby it is made uneatable, and then either boiled down for smearing grease or delivered over to the nearest knackery. It is not allowed to be given to the lower animals, even in its raw state, and every possible precaution must be taken to prevent the access of rats and mice to it. Whoever transgresses is punishable. According to the order of the OBERPRÄSIDENT of the province of Saxony, every swine slaughtered in the province must be examined for trichinæ and a certificate thereupon must be exhibited. Should trichinæ be found, information is to be given forthwith to the nearest police commission, and the whole of the affected pig must be buried in accordance with prescribed regulations. In this proceeding, there is an infringement of private rights, since by properly preparing the flesh, trichinæ are effectually destroyed and thereby rendered positively harmless, and, moreover, many parts probably are quite free from them. The above measures might much more justifiably be applied in cases of measles where the parasites are present in large numbers and of greater size, preventing, by their water-sacs, the flesh even by curing from being effectually preserved against putrefaction; and further, as they become cartilaginous or osseous from age, rendering mastication unpleasant, and imparting a disagreeable flavour.

From what has been stated, it is evidently of the highest importance that swine should be prevented from devouring rats and mice as well as carrion, and that they should be supplied with good food only. In Austria, knackers are forbidden to feed their pigs with carrion.

Microscopical examinations, carefully made, are the simplest protective means against trichinæ, for in the various methods

of dressing pork, an error on the part of the cook can easily take place. A faulty microscopical investigation, however, can only be compensated for by a most careful preparing of the meat.

NOTES ON THE INFLUENCE OF ATMOSPHERIC PRESSURE AND ALTITUDE ON HEALTH AND DISEASE IN MAN AND THE LOWER ANIMALS.

By G. Fleming, F.R.G.S., &c., Royal Engineers.

(*Continued from p.* 430.)

"The animals which inhabit the hot countries contract maladies which can readily be attributed to the modifications determined in their organization under the action of the influences already noticed. Dropsies of every kind are developed with an astonishing rapidity, and, by reason of the abundant transpiration, and the feeble reaction that the weakened organs can oppose, the most exciting causes, instead of determining sthenic inflammations (*inflammations franches*) which usually follow the state of irritation they determine, only produce asthenic, chronic, and often imperceptible inflammations, terminating in dropsies, pulmonary phthisis, or in cachexias. This fully demonstrates the facility with which the climate of the torrid zone prostrates the vital powers, and induces in the nervous system and the blood those alterations characteristic of typhoid affections.

"Diseases of the skin are generally common, and present a high degree of gravity, which is especially evidenced in the "grease" (*eaux aux jambes*—the 'impetigo sparsa digitata' of Greve) and ulcerations of the skin (*crevasses*). Then come the chronic maladies of the digestive canal, with manifest ulceration of the hepatic gland, and the jaundice, which is nearly always allied with the affections of the abdominal organs. Derangements of the nervous system are equally common, and are the consequence of the facility with which the cerebral functions are exalted under the influence of heat; thus it is that in nearly all maladies we see the well-developed phenomena of superexcitation—the trembling disease of the sheep (*maladie tremblante*, probably the same disease as the Scotch 'louping-ill,' and the German 'Traber und Knupperkrankheit,' and 'Kreuzdrehe'); epilepsy and tetanus are more common than in our climates. Lastly, the diseases of the blood—all those pathological alterations

known under the generic name of cachexia, anemia, hydroemia, and which are due to the simultaneous diminution in the proportion of albumen and fibrine of this fluid, and even sometimes to that of the fibrine, dominate the medical constitution of the littoral zone. It may also be added that here diseases assume with facility an epidemic type, and for their development they find all their elements of predilection during the period of extreme heat and dryness in the months of March, April, and May. In addition to this, the rapidity with which dead bodies and organic matter deprived of life are decomposed, and the facility with which their elements are carried about in this thin atmosphere, give rise, with wonderful speed, to septic, malignant, and putrid affections, and the disposition which the pores of the skin have to allow these to penetrate are so many causes which favour contagion.

"*En résumé*, the maladies which attack animals inhabiting the torrid zone are remarkable for the sympathetic debility accompanying them, and their distinguishing sub-inflammatory character."*

After pointing out the influence of marsh effluvia so prevalent in this low altitude, and showing that chronic affections prevail in the veterinary pathology of this region, he enters on the consideration of the second altitude of from 1000 to 2000 metres.

"At this elevation we enter the temperate zone, admirable for the uniformity and mildness of its temperature. It gives a mean annual heat of from 19° to 20°, which insignificant oscillations rarely vary more than 5°. This would be the climate of Italy, if the elevation contained vast habitable plateaux, and if the fogs did not make it their domain. This altitude, however, presents, particularly towards the Gulf, a sudden inclination, and it is inundated by rains during a portion of the year. It is to the multiplicity of its water-courses, nevertheless, and which are maintained by the storms and by the melting of the snow on the surrounding peaks, that this temperate region owes its vegetative power. It must be said, also, that the nature of the soil forbids the existence of malarious influences.

"The prevailing atmospheric constitution is that of a temperate and humid climate; and this would most certainly be very injurious if it was not modified by altitude, by the

* It must not be forgotten that this "Tierra caliente" is remarkable as being the region in which a dreaded deadly bovine anthrax disease—the *calentura del Piojo*—prevails, a malady very readily transmissible to the human species.

active evaporation which takes place on the surface of the earth, and even by the nature of the soils, which absorb by imbibition the humidity constantly present on their surface. The volcanic nature of the earth, which is generally cultivated, does not permit the presence of any liquid on its bosom. So that the tierra templada enjoys during winter a delicious climate. The broken configuration of this zone also permits us to find in it a variety of climates and temperatures. Here there are valleys; there chasms or gorges in the mountains, each of them presenting varied atmospherical characters, which have an influence on animals, modifying their constitution and temperament, and in a peculiar way creating individuals possessing different morbid specialities.

"The mountains themselves, according to their height, constitute so many different climates: at their summits we meet with the temperature of the polar regions; at their feet a temperate zone; and lower still, that of a hot climate. Thus, all the temperatures may be remarked in this zone, although, notwithstanding, there is no difficulty in fixing upon the predominance of the sanguine-nervous temperament.

"Under the meteorological conditions prevailing in this temperate zone, digestion is easy and regular, and furnishes to the whole of the system the elements necessary for very active nutrition. The contractions of the heart are energetic and frequent, the blood circulates rapidly, and the capillaries act with vigour, their tonicity and contractility being marked. The respiration participates in this activity, and the movements of the thorax are executed with facility. Absorption is carried on with regularity; the exhalations are abundant, without being excessive; and the secretions are fruitful in results. Nutrition is much developed; the assimilative powers active; the blood is rich in nutritive materials; and the muscular contractions are very energetic, because the muscles immediately derive from the blood the fibrine which constitutes the basis of their texture, and so acquire a considerable volume and an extraordinary power.

"These conditions of the air and soil are very favorable to animals, owing to the free play of organs and the easy mode of life allowed. The different species live there a long time, and escape the murderous epizootics which are developed so frequently in the other parts of Mexico. In the temperate region the medical constitution loses much of the complication which we have noted for the preceding zone; and if it is true to say that every disease is observed here, there is yet no need to remark that a single phenomenon do-

minates its pathology. On the contrary, we see quite another order of maladies, in the midst of which there can be distinguished, with superior frequency, catarrhal and inflammatory constitutions. By the expression 'catarrhal' we designate nothing else than the frequency of diseases of the mucous membranes, and the general tendency of their phlegmasiæ to be accompanied by morbid secretions. With regard to the inflammatory constitution, it is intended by it to express the idea of phlegmasias, and, consequently, that of blood alteration, characterised by augmentation in the proportion of its fibrine. To these constitutions may be added two others, which make them mixed. These are, the so-called bilious constitution, marked by the increase in the biliary secretion, and the nervous constitution; that is to say, accompanied by accidents or nervous symptoms of various kinds. The catarrhal affections are explained by the meteorological state of the country—the heat alone accounts for the bilious constitution; the variations of temperature for the nervous constitution; and the hot exciting air for the inflammatory constitution. Acute diseases dominate veterinary pathology in the temperate zone, and intestinal affections constitute the type."

The Altitude above 2000 *metres.*—"At 2000 metres we arrive at the plateau of Anahuac, in the 'Tierra ria.' This designation is only relative; for if we consider the ordinary altitude of the plateau; if we take into account those portions of it which are most populated; and if we allow for the cold produced by the nocturnal diminution of temperature, the atmosphere has, in this region, a very agreeable mildness. The winter is dry throughout. The heat is diminished towards evening, but ice is rarely formed. From nine o'clock in the morning the thermometer ranges from 15° or 16° centigrade, and it is never less than 14° mean temperature during the winter season. The summer is tempered by the regular rains of the tropics. The thermometer does not fall below 15°, and scarcely ever exceeds 22°; the annual mean of this season is between 19° and 20°, and the annual temperature 17° centigrade. The nature of the soil is volcanic, and the quantity of calcareous salts it contains confers upon it everywhere a grand fertility. In ascending the plateaux we arrive in this zone where the physiological and pathological conditions of the lower animals present peculiarities of which until now we have had very few examples. The most important atmospherical modifications we have to study are those which are due to the diminution of the air as we ascend. As a consequence, it may be stated that the effects

observed in health, as also in disease, are all due to the following general fact:—The air being less dense and more rarefied, contains in a given volume a smaller quantity of oxygen. Therefore, in order to respire freely, one is obliged to introduce at each inspiration a larger amount, a task scarcely possible; or to compensate for the diminution by more frequent inspirations. It is this last which takes place, and the general phenomenon by whose aid we explain all the other organic modifications is this greater frequency in the respiratory movements. In whatever medium animals may be destined to exist, there can be no doubt as to the occurrence of physiological alterations in their constitution, temperament, and habits in harmony with this medium. So it is that amongst the animals of Anahuac we remark modifications of the constitution compatible with the rarefied air they respire; and for this reason it is that we see the respiration and circulation executed in them with a much greater frequency than at the level of the sea. Although this frequency appears to be habitual and quite normal, we believe that the great rarefaction of the atmosphere at Anahuac,—the direct consequence of its elevation above the sea's level, if it does not oppose a serious difficulty to the accomplishment of the respiratory function, should yet be considered as very pernicious, because of the necessity which exists in animals so placed to exercise more energetically the respiratory and circulatory organs, thus augmenting their impressionability and favouring the development of maladies, by the morbid predisposition it engenders in these apparatus. Certainly we must not forget that time and habitude may profoundly modify the functions and even the organism itself, in such a way as to correct those influences which may be injurious to health; but whatever may be the individual modifications susceptible of dissimulating the unfavorable actions, it must be admitted that these can never be absolutely neutralised, and that a certain pathological originality discovers their unmistakeable effects. So it happens on these great elevations; and one phenomenon above all the others attracted our attention on the plateau of Anahuac; this was the facility with which symptoms of asphyxia showed themselves in affections, apparently the most trivial, of the respiratory or circulatory organs; and another phenomenon was the tenacity which congestional disorders manifested in this region. These, in fact, were the morbid peculiarities which dominated veterinary pathology, consisting, as they did, almost exclusively of organic affections of the heart, and the respiratory apparatus. Pharyngitis was one of the most common of the

phlegmasias frequently observed amongst the animals of the country. It was due to the diminution of the pressure, and the great dryness of the air, which, acting directly on the mucous membranes, caused in them a sudden evaporation that desiccated, chilled, and irritated them. Pneumonias were also very frequent at these altitudes, and were caused by the facile and often sudden changes of temperature, the transition from the burning sunlight to the shade—the freshness of the nights, and the evaporation from the skin—considerations which constituted so many causes of a nature to influence in a pernicious manner the functions of the lungs. Most ordinarily these same atmospheric conditions of this zone impressed on this malady serious characters, not only because the affected organ was itself the seat of hæmatosis, but because, already so menaced in its physiological state, by the rarity or lightness of the air, it was yet evidently still more altered under the influence of a disease which destroys the permeability of its substance. It is in cases of this nature that symptoms of asphyxia become so extremely marked, and we might easily understand how this should occur in those serious attacks in which there is extensive hepatization; but when we meet with these grave symptoms in animals suffering from slight pneumonia, or whose lungs are only affected to a very limited extent, we are compelled to direct our attention to the rarefied air that the sick animals respire, and to seek in it for an explanation of a phenomenon which, without doing so, would otherwise not be easily interpreted.

"Pulmonary phthisis in cattle is frequent on the plateaux. At all times, endemic and hereditary, it attacks animals which are predisposed, as well as those whose privileged constitution would almost appear to guarantee them against its invasion. We see it not only amongst the stocks of small proprietors, whose means do not allow them to build good stables, or to feed their cattle independently of the humid pastures, but also equally amongst those which are maintained in relatively good hygienic conditions. Pleurisy is not rare; and can we be surprised? Is the influence of chills to the surface of the body in the production of inflammations and effusions of the serous membranes not known in every country? The great evaporations taking place at Anahuac determines in the organism variations of temperature which affect the periphery of the body.

"Congestions in general are common, but apoplexies of the lungs are, above all, of remarkable frequency. Disturbances of the nervous system are also common at this altitude. The

imperfect reaction of the organism, through imperfectly oxygenated arterial and venous stagnation, gives rise to vascular engorgements which fix themselves in certain parts already predisposed by their functions or their intimate structure. Pulmonary congestions are, therefore, very frequent, and, we again repeat, the tenacity of the congestional phenomena is here a fact of exceptional gravity. Under ordinary circumstances, indeed, one generally has at his disposal means efficacious enough to combat with success a morbid state of this nature, and some few consecutive cares after a cure has been effected are all that is necessary for the durable re-establishment of health. This is not the case at Anahuac. The congestive state, without phlogosis, may continue for a very long time, and even when dissipated returns again with the most astonishing facility.

"Pulmonary emphysema, with dilatation of the right cavities of the heart, attacks more or less rapidly all the solipedes which live on the plateau of Anahuac, just because a rarefied air demands the greatest efforts of the thorax in order to introduce a sufficiency for the wants of the body. Here is a powerful cause in itself for the production of pulmonary emphysema, although it is said that at high altitudes the diminished weight of the atmosphere exercises a lessened pressure on the pulmonary viscera, and tends to dilate them so much less. However this may be, and in what manner soever altitude has an influence in the etiology of pulmonary emphysema, it is indubitable that its action greatly favours the accidents which complicate a residence in it. Accidental obstructions to the respiration, when added to the habitual difficulties encountered in the hæmatoses of the blood, prematurely terminates the career of a considerable number of animals.

"*En résumé*, the plateaux expose animals to the combined influences of diminution of the density of the air, and the frequent lessenings of temperature determined by the ready evaporation taking place at this elevation. These influences chiefly confine their action to the respiratory and circulatory organs, and their effects are betrayed by anginas, pneumonias, bronchitis, tubercles, and of emphysemas of the lungs, accompanied by an extremely tenacious congestive condition, and very serious symptoms of asphyxia."

This veterinary surgeon elsewhere, in speaking of the enzootic diseases of Mexico, tells us that the "cachexie" is most destructive amongst animals in the marshy regions, as is also the case with the human species, and complicates every other disease; that tubercular phthisis constantly pre-

vails in a sporadic manner in the three zones of altitude, affecting, according to his calculation, 34 per cent. of the cattle; that hydatid diseases are particularly prevalent amongst pigs in the hot zone; that periodic ophthalmia is particularly common in the same zone, and in the others where the causes of catarrh are numerous, but without proving very fatal to the vision; and that pulmonary emphysema is betrayed in nearly every Mexican horse by altered movements at the flank, a circumstance due, he thinks, no less to the faulty manner in which they are educated to the various rapid *allures*, *saccades*, and impetuous *arrêts*, than to the influence of altitude. He also remarks that, owing to the dryness and purity of the atmosphere, epizootic diseases are less frequent and redoubtable on the plateaux than in the valleys and low zone.

"I am not, however, desirous of saying that the atmospheric constitution of altitudes is unfavorable to the development of epizootic affections. Notwithstanding all that has been said by worthy men in this respect, I have never believed that the greater density of the air ought to be considered as a cause which might arrest the development of an epizootic constitution. In the month of August, 1864, I witnessed an epizooty of anthrax fever (*typhus charbonneux*) which had occasioned the greatest ravages amongst the herds in the valley of Mexico. Altitude is not, then, an obstacle to the transmission by the air of a contagious virus; and the tendency of diseases to become generalised at high altitudes cannot be contested. But yet it must be recognised, that if these do not prove a barrier to the invasion of epizootys, yet they modify them in such a way as to diminish their fre- quency and retard their propagation."

The influence of altitude is also stated to produce alterations in the symptoms and progress of the epizootic diseases, which are chiefly anthracoid affections in general, and affect horses, cattle, sheep, and pigs; gangrenous pneumonia, gangrenous angina, certain forms of dysentery, and the *cachexie aqueuse*. Some of these maladies are altogether peculiar to the hot zone, where they reign epizootically nearly all the year. Variola, ovina, and the exudative pleuro-pneumonia of cattle have not yet been carried to these countries, so that we do not know what influences elevation might have on their fatality and spread there. Glanders, however, was introduced to Vera Cruz by the Americans in 1847, and since that period has become domiciled in the country, though owing to the horses and mules being nearly always kept out of doors

breathing pure air, cases of the disease are extremely infrequent.

"It is remarkable to see the rapidity with which wounds cicatrise on the plateaux. The altitude of these places, and the constant renewal of the air, explains this result. Let us notice, however, that it is not the same in the torrid zone bathed by the ocean. There, the least solution of continuity may prove the cause of death to animals; there, also, sympathetic farcy (*farcin symptomatique*), or lymphangitis, may become a local and often general complication." Rabies is rare.

The influence of altitude would also appear to be very favorable to the emasculation of the lower animals. We are told that the Mexicans castrate their horses by simple excision of the testicles; that is, they merely expose the gland, and remove it by dividing the vessels and cord, without taking any trouble about tying the artery or using clams. After this simple operation, the animal is led to a bath, where it is made to swim for some minutes, and a handful of hot ashes is then sprinkled over the wound. It is very rare that any accident happens. M. Liguistin asks if this immunity is to be attributed to the particular temperament of Mexican horses, or to the effects of altitude; or if the rarefaction of the air exercises a salutary action on the cicatrisation of traumatic wounds?

In the "yellow fever," or "black vomit" of this region, we have a good example of a disease limited in its range by altitude. Humboldt asserted that the farm of Enciero, near Vera Cruz, 3043 feet above the sea level, is the superior limit of *vomito;* and that strangers who come by sea, and therefore pass through a gradual change of atmospherical temperature, are observed to be less liable to contract the yellow fever than the whites and mestizoes who inhabit the tableland of Mexico (the mean temperature of which is about 60° or 62° Fahr.), when they descend during the wet season to the port of Vera Cruz. The rains begin in May and end in October, when the *nortes*, or north winds, set in; and during the prevalence of these winds the *vomito* disappears. There is a curious difference in this respect between the yellow fever and that strange malady affecting the natives of the tableland only—the "Matlazahuatl."* According to Dr.

* "Le site principal du *vomito prieto* est la region maritime, dont le climat est excessivement chaud et humid. Le Matlazahuatl, au contraire, porte l'epouvante et la mort jusque dans l'interieur du pays, sur le plateau central, aux regions le plus froides et les plus arides du royaume." 'Essai Politique sur le Royaume de la Nouvelle Espagne,' vol. ii, p. 69.

Smith,* this "vomito negro" has very rarely been known to pass the mountain barriers which separate the Atlantic from the Pacific.

Stony Hill, Jamaica, is said to be rarely visited by yellow fever, though only 1300 feet high. Last year, however, the malady appeared at Newcastle barracks, a military station for the white troops in the mountains, at an elevation of from 3500 to 4120 feet above the sea level, and several cases proved fatal. The malady, however, was carried to that altitude from the low regions.

Gôitre, as already remarked, is another affection that appears to be influenced to some extent by altitude. In Russia and Europe generally, it would seem to be most prevalent in close valleys where trees grow luxuriantly, about 1700 feet above sea level; 795 feet appears to be the lower limit of the malady.† In Java, Sir Stamford Raffles writes: "Here, as in Sumatra, there are certain mountainous districts, in which the people are subject to those large wens in the throat, called in Europe *gôitres*. The cause is generally ascribed by the natives to the quality of the water; but there seems good ground for concluding that it is rather to be traced to the atmosphere. In proof of this, it may be mentioned that there is a village near the foot of the Teng' gar mountains, in the eastern part of the island, where every family is afflicted by this malady, while in another village, situated at a greater elevation, and through which the stream ascends which serves for the use of both, there exists no such deformity."‡

At the Paraiba, Brazil, Spix and Martius observed gôitre to prevail to a great extent, chiefly among the mulattoes. "The causes of this deformity seem to be quite the same here as in other countries. For it does not occur in the high, colder, and airy mountainous districts, but in the low valley of the Paraiba, which is often covered with thick fogs."§

Hooker appears to think that it is induced amongst the Bhoteeas, who are very much troubled with it, by the shoulder-strap they use in carrying loads, which causes congestion of the laryngeal vessels. "The Lepecha is certainly far more free from this disease than any of the tribes of East Nepal I have mixed with, and he is both more idle and less addicted to the head-strap as a porter. I have seen it to be

* 'Peru as it is,' vol. ii, p. 197.

† Erman, 'Travels in Siberia,' vol. ii, p. 332. Foderé, 'Traité du Goitre et du Crétinisme. Wenzel, 'Ueber den Cretinismus.' Vienna, 1852.

‡ 'History of Java,' vol. i, p. 60.

§ 'Travels in Brazil, p. 316.

almost universal in some villages of the Bhooteas, where the head-strap alone is used in carrying in both summer and winter crops; as also amongst the salt traders, or rather those families who carry the salt from the passes to the Nepalese villages, and who very frequently have no shoulder-straps, but invariably head-bands. I am far from attributing all gôitre, even in the mountains, to this practice, but I think it is proved that the disease is most prevalent in the mountainous regions of both the old and new world, and that in these the practice of supporting enormous loads by the cervical muscles is frequent. *It is also found in the Himalayan sheep and goats which accompany the salt traders, and whose loads are supported in ascending by a band passing under the throat.*" *

Many additional examples of the effects of altitude might be adduced; but it is assumed that sufficient have been offered to prove what has been asserted in the commencement of these notes; and it only now remains to draw the attention of veterinary surgeons to a matter of so much importance as the study of "medical geography," or, rather, "topography," intimately connected as it is with their profession in a scientific and utilitarian point of view.

THE ABYSSINIAN CAMPAIGN.

By the Same.

The Abyssinian campaign just terminated, and which has proved so marvellously successful in its results, has not been without special features of interest to the Veterinary profession, in this country at least; from the fact that our army was invading what might well be termed a "*terra incognita,*" to perform a series of long marches through Alpine regions destitute of roads, and where everything, it may well be said, depended upon the quadrupeds employed being maintained in a state of efficiency. The strain thrown upon the Veterinary department of the expedition must have proved very great, and much beyond that encountered by the sister branch of medicine; inasmuch as the animals collected from all the surrounding countries were nearly as diversified in their kind as in their origin. There were camels from Asia and Africa; and the gigantic elephants of Hindostan were floated

* Op. cit., vol. i, p. 134.

by sea to perform such duties in this wild country as must have astounded their untamed brethren of Ethiopia. India, Egypt, Syria, and Asia Minor, furnished horses; and that indispensable hybrid of every campaign—the mule, was draughted from India, and nearly every country bordering the Mediterranean; from the unmatchable miniature creatures of Cyprus, Syria, and Asia Minor, to the tall, gaunt, Spanish mongrel, whom it is a loss and a fallacy to move out of its own country to the exposure and fatigue of warfare. In addition to this heterogeneous assemblage of animals there were oxen, Abyssinian as well as imported; indeed, every creature capable of undergoing fatigue and carrying a load was pressed into service. While the human portion of the expedition was revelling in robust health, a deadly epizooty, greatly aggravated by scarcity of water and food, attacked the solipedes before the army left the coast of the Red Sea for the highlands, and in destroying great numbers, it must have severely taxed the energies of the Veterinary surgeons who had to deal with it. Then there were the harassing marches over steep trackless mountains and arid plains, with an insufficiency of water nearly the whole distance to Magdala, which must have added immensely to the number of casualties among the overworked transport animals. But every obstacle appears to have been successfully encountered, and the Veterinary department of the Abyssinian expedition has afforded an additional proof of the great services our science can confer, no less in peace than in war, when it is not obstructed by the ignorance or prejudice of those who would gladly maintain it in a degraded condition.

The able and scientific general who has added another illustrious name to the long list of warriors our country proudly claims, with a justness and thoughtfulness which should make us deeply grateful, has not forgotten to acknowledge these excellent services of the department and of particular individuals, but in the despatch dated from Koomeley, June 1st, 1868, in noticing the manner in which the various duties of corps and departments had been carried out, he writes: "The services of the veterinary department, under Staff Veterinary Surgeon Hallen, an able and valuable officer, have been of the highest importance. A copy of Mr. Hallen's report on the working of this department is attached; Mr. Hallen makes special mention of the services of first class Veterinary surgeons Lamb and Anderson;" and again: "I desire to express my appreciation of the very great services of Staff Veterinary Surgeon Lamb, Veterinary Surgeon Anderson, and the officers of that department."

The army Veterinary surgeons, no less than those in civil life, cannot fail to receive this high testimony to the merits of their professional *confrères* with unalloyed satisfaction, and our hearty congratulations are due to them for having thus distinguished themselves during an arduous, if brief, campaign, by attempting to dignify a science which, for utility and humanity, is, perhaps, second to none.

Since the beginning of this century, more extensive wars have occurred, the services of veterinary surgeons have been as freely rendered, and, perhaps, the army veterinary department has been more severely tested in the field; but never until now, so far as I am aware, have the benefits derived been acknowledged as in this instance.

It is only scientific men who can appreciate science. The conqueror of Magdala is the first commander, who, having received a scientific training, has been entrusted with the leadership of an army; let us hope that this precedent will be carefully followed in our future wars!

THE PRINCIPLES OF BOTANY.

By Prof. Buckman, F.L.S., F.G.S., &c., &c.

The botanist, like the zoologist, experiences great difficulty in defining the exact characters pertaining to the objects of his pursuit,—what is a plant? what is an animal? being questions hardly yet settled, and for the reason that Nature has no hard lines of demarcation, and hence the subjects belonging to either science have afforded much matter for discussion as to where animals end and plants begin, and the veteran in one science is constantly making petty raids into the kingdom of the other.

That there should be conflicting opinions among naturalists as to the nature of the simpler forms of life need not be wondered at when some acute observers, such as Bory de St. Vincent and Kützing, assert that there exist organized bodies which are animal at one period of their lives, and vegetable at another: and he points to the *Ulothrix zonata*, an algæ as exhibiting "cells in which are found minute animalcules, with a red eyepoint and transparent mouthpiece, and that they are not distinguishable from Ehrenberg's *Microglena monodina*—an infusorial creature. These bodies, however, are animals only for a time. At last they grow into vegetable

threads, the lowest joint of which still exhibits the red eye-point."

The chemist, as well as the naturalist, has attempted to define the limits of the two kingdoms. According to these nitrogen is appealed to as a certain characteristic of animals, but fungi are so rich in nitrogenous compounds as to cause them to exhale the smell of cooked meat, of which they possess all the agreeable flavours.

The presence of starch, again, has been held to be positive evidence of vegetable origin, and there is reason to think that this is really one of the best marks we can appeal to. Starch is present in quantity in the algæ, and Meyen first directed attention to the presence of starch as a conclusive proof that the desmidieæ are algæ, and therefore vegetables, though many previous observers had claimed them for the animal kingdom.

These remarks, then, would lead us to conclude that plants, like animals, are built up of cellular matter, and, as observed by Henfrey, "the animal and vegetable kingdoms, so distinct and opposite, both in appearance and function when taken in their entirety, approach gradually by their lower tribes until at the extreme point they meet in the simple cell which stands, as it were, *on* the limit. Here all our means of diagnosis fail us; we cannot assign *this* as a subject to either, exclusively, since it possesses characters in common with both: the power of motion we had hitherto regarded as exclusively belonging to animals; the nutrition by absorption through an external membrane, is remarkably distinctive of plants. We must be content, then, to take general characters instead of a definition—characters founded on whole kingdoms instead of on individuals, and thus to come to an appreciation of the important relation they bear to each other."

The differential characters given by the author are of two kinds, chemical and vital.

Animal structures are generally quarternary compounds, consisting of carbon, oxygen, hydrogen, and nitrogen; they consume oxygen and exhale carbonic acid, are resolved into carbon and ammonia when burned, and restore the elements to the air or earth by transforming organic substances into mineral. Permanent vegetable structures are generally terniary compounds, consisting of carbon, oxygen, and hydrogen; they give off oxygen and fix carbon, are resolved into carbon and acetic acid when burned, and derive their elements from the air or earth, transposing mineral substances into organic.

The general differential vital characters are,—Animals possess the faculty of nutrition which takes place by absorp-

tion through a membrane *lining* a stomach or cavity open to the external medium; they have sensation and voluntary motion.

Vegetables possess the faculty of nutrition, which takes place by absorption through a membrane surrounding an internal cavity, which is a closed sac; they do not possess sensation or voluntary motion.*

Now, though many exceptions may be taken to the above, they are sufficiently explicit for our purpose, and we start, then, by considering a plant in its simplest form as a single cell or sac. *Uredo.*—In the more complex plant this cell is mounted on a second, which acts as a pedicle thereto. *Puccinia.*—Here the pedicle is the initiation of an organ; and as we get higher in the series, cells themselves become differential, not only as to structure, but as to function, and thus a little consideration will enable us to arrive at a kind of cellular classification of the vegetable kingdom upon the following principles:—

Oviparés—

(*a*) A cell, a simple plant multiplying by division.
(*b*) Many cells separable into organs.
(*c*) The reproductive organs giving off a separable cell—a *spore*—the seed—*Agaric.*

Vivipares—

(*d*) A separable cell—*Pollen*—acting on a special organ, the *pistil* giving rise to a seed, or separable bud.

Hence we see that the cell may be a distinct individual in the lower forms of vegetable life, while it forms *organs* in higher plants, which are complex in structure, and highly varied in function.

The combination of cells in the organs of plants give rise to different kinds of structures called tissues, the principal of which are—

I. Cellular Tissue, or Parenchym.
II. Woody Tissue, or Pleurenchym.
III. Vascular Tissue, or Trachenchym.

1. *Cellular Tissue.*—If we take a speck of the black dust brand from a diseased ear of barley which has been so abundant this season, and place it under the microscope previously moistened with a little solution of potash, we shall

* See Henfrey's 'Outlines of Structure and Physiological Botany.'

see cells in a most simple form. These are, in fact, mere sacs with internal nuclei, and each is a separate and independent plant.

If, again, we subject a thin slice of the pith of elder to the half-inch objective we shall trace a beautiful network whose meshes are hexagonal in shape; these, too, are cells forming a part of the system of a higher plant, and we soon become aware that this mesh-like arrangement is due to closely packed cells pressing against each other in every direction, for on boiling a bit of the pith they may be readily separated from each other.

If we take off the epidermis of a leaf or the petal of a flower we shall be able to trace cells arranged in the same mesh-like manner, but with the lines having a more or less waving character.

The *Parenchyma*, or substance of the leaf or petal, will be no less cellular, but in these the cells will be filled up with some coloured substance, while the dermal cells were empty.

Cells are not always hexagonal by pressure; they may assume many forms, according to the direction of the exerted pressure, or the axis of development; hence we have oblong, cubical, fusiform, muriform, compressed, sinuous, stellated, and many other cell forms. The meshes, indeed, of cellular tissue, not being woven with a continuous thread, but made up of double walls by the presence or packing of cells one against the other. Hairs are good examples of cells placed end to end.

II. Woody Tissue—is perhaps an elongated form of cellular tissue; it is tough, elastic, and in its dry state transparent, and consists of much elongated club-shaped cells arranged side by side. Its tenacity enables its manufacture into different kinds of material, as linen from flax; ropes, &c., from hemp; these are composed of woody tissue, but cotton, being delicate hairs, is composed of cellular tissue, and hence its inferiority in strength to the threads of flax. Woody tissue has been named as of various kinds, but as it is our object to be as simple as possible, we shall not complicate our subject by their description.

III. Vascular Tissue—is doubtless a modification of cells. According to Lindley "this consists of simple membranous tubes tapering to each end, but often terminating abruptly, and having a fibre generated spirally in the inside."

These compose vessels which are said to be formed by the anastomosis of simple cells. In them the elongated cell-wall

is filled with a single or double spiral membrane. These spires break up, and form reticulated, scalariform, and pitted tissues.

Now these tissues cannot be adequately studied without careful microscopic research, nor can they be well understood without a large series of drawings. We must, therefore, for the present, be content with having shortly pointed out the elements of plant anatomy, and it will be our next duty to show how these are allocated and arranged in the structure of the different organs of plants.

NOTES ON FATTY DEGENERATION IN THE KIDNEY OF THE DOG.

By Edward Nettleship, M.R.C.V.S., L.S.A., M.R.A.C.

I send a few notes on some pathological changes in the dog's kidney, of which I have not hitherto been able to find any account in our home literature on canine diseases.

In making a *post-mortem* examination of a fox-hound bitch, that was killed as useless, I was struck by the peculiarly pale colour of the outer surface of the kidneys, and made a more careful inspection of them than one ordinarily does in such cases. On slicing the organs longitudinally in the ordinary way, the general colour of the cortex was seen to be unusually pale, but on careful examination with the naked eye, the pallor was found not to be uniform, the Malpighian bodies being very distinct as so many red dots, and the deficiency in general colour was due to the tubular portion of the cortex. This pale colour extended to some depth below the proper cortex almost into the bases of the pyramids. The pyramids themselves had their usual tint, but were streaked with fine whitish lines in moderate abundance.

My first impression was that the convoluted tubes of the cortex had undergone fatty degeneration, and I was inclined to disregard the pale colour of the bases of the pyramids, and the whitish streaks in the pyramids themselves. Microscopic examination, however, showed that this opinion was erroneous. On being magnified 200 diameters, the Malpighian bodies and convoluted tubes appeared, so far as I could determine by the method employed, free from disease, but in the part immediately succeeding the convolutions, and where the tubes first become straight, everyone was seen to be filled with oil-globules, and no traces of the proper

epithelial cells were visible. On following the tubes inwards, this peculiar appearance was found to cease almost as soon as the tubes began to collect together into distinct pyramids, and the epithelial cells again appeared. For some distance after the disappearance of the fat in the tubes, the tubes of the pyramids were natural, but towards the middle of the pyramids other tubes containing fat were seen; these fatty tubes, however, were very much less numerous than those to which allusion has been made above, neither was there, so far as I could see, any connection by lines of oil-globules between the two sets of fatty tubes. I was not able to trace any of the fatty tubes in the bodies of the pyramids, so far as their apices, but in numerous cases they were seen to form loops before reaching the pyramid apex, and return upon themselves; this proved them to be the so-called "Henle's tubes." These tubes were the whitish streaks before alluded to as visible in the pyramids.

In taking a section of this kidney from capsule to pelvis, I, therefore, distinguished the following zones:

1. The cortex proper, in which I could see no changes under the microscope, though the tissues between the Malpighian bodies had a very pale colour to the naked eye.

2. A zone, which may be called the deep layer of the cortex, or the beginning of the bases of the pyramids, composed of the first straight part of the tubes, and exhibiting an extensive deposit of fat-globules in these tubes.

3. A zone immediately within the former, and which may be fairly described as forming the bases of the pyramids, in which the tubes appeared perfectly healthy under the microscope, and in which the naked eye appearances were also normal. Between this and *zone* 2 was a pretty sharp line of demarcation both to the naked eye, and under the microscope, caused by the sudden and complete disappearance of the fat from the tubes.

4. The pyramids themselves, in which, about their middle, were sundry tubes ending often (if not always) in loops, filled more or less with fat globules ("Henle's tubes"). Between these and the fatty tubes of *zone* 2 there was no correspondence in number, nor could any structural connection be traced between them. These tubes when not seen to end in loops could never be traced so far as the apices of the pyramids, and from various appearances, I am inclined to think that they all really were looped, and that the appearance of free ends in certain cases was caused by the loops having been cut in making their section.*

* A similar appearance (fine white lines converging to the apices of the

I do not propose on the present occasion to say any more about the condition of Henle's tubes, because I believe that they are often the subject of fatty degeneration in man. What seems to me remarkable is the state of the uriniferous tubes just where they pass from the convoluted to the straight arrangement. The appearance of the fat globules corresponds almost accurately with the change of any tube from "convoluted" to "straight," and only in one or two instances was I able to trace the fat for a short distance in a *convoluted* tube. Not less curious is the equally sudden disappearance of the fat globules from the straight uriniferous tubes as these approached the pyramids.

The urine of the bitch from whom these kidneys were taken contained albumen, and a fair number of renal casts of the "waxy" or "hyaline" variety of various diameters. Many of the casts contained oil-globules imbedded in their substance in greater or less numbers.

I thought at first that there was some correspondence between the symptoms during life and the above-described changes in the kidneys. A short time afterwards, however, I made an equally careful examination of the kidneys of a dog, apparently in perfect health (destroyed for dissection) and found exactly the same changes to almost as great an extent. I subsequently examined the kidneys of two other dogs, one apparently healthy, the other (a puppy only nine weeks old), having died from marasmus, caused seemingly by a large number of ascarides in the small intestine. In both these cases the same changes were detected, though in the puppy the fatty degeneration had not gone so far as in the adult dogs. In the last three cases the cortex had a perfectly healthy colour and texture, the fatty zone (No. 2) was clearly defined by its pale colour. I was unable to examine the urine in any of these three cases.

I have made no reference to any renal structures except the uriniferous tubes. With regard to the small arteries and veins, there was certainly no fatty degeneration of their coats, and their muscular fibres were very distinct, though

pyramids) is often seen in the kidneys of the sheep. I have examined one or two such specimens, and found that the appearance (so similar to the naked eye to that in the dog) was due to an entirely different cause. The fine whitish yellow lines in the pyramids of the sheep's kidney are caused by numerous particles (? crystalline) of irregular shape, and under the microscope, either opaque from their thickness, or yellow. They are not confined to Henle's tubes, neither are they fatty, for they disappear with efflorescence on the adddition of an acid; hence I conclude that they are composed, at least partly, of some carbonate, insoluble, or nearly so, in water.

whether they were hypertrophied or not I am unable to say.

The facts which seem most suggestive of further inquiry on this subject are—

1st. The existence of a form of fatty degeneration in the kidney of the dog which does not necessarily co-exist with any obvious ill-health in the animal.

2nd. The occurrence of this degeneration to some extent at a very early age.

3rd. The limitation of the fatty change to two different and widely-separated parts of the uriniferous tubes.

Fatty degeneration occurs in the human kidney, and I believe commonly in the kidney of the cat, but I am not aware that the fatty matter is confined in these cases to any particular part of the uriniferous tubes.

In examining these kidneys, I found that the changes were most easily observed by making moderately thin sections, soaking them for a few seconds in strong acetic acid, and examining them in a mixture of Price's glycerine and water, of each about equal parts. Pure Price's glycerine obscures the oil-globules, because, as I suppose, its refractive power is nearly the same as that of the oil.

THE SCIENTIFIC EDUCATION OF VETERINARY SURGEONS QUESTION.

By the Same.

With all deference to the opinion expressed in your last leader, I venture to think that there is no very great difficulty in giving an answer to the first question in Mr. Greaves's letter which shall be satisfactory at once to the advocates of a comparatively low educational standard for veterinarians, and to those who see in a "highly scientific education" one of the necessary conditions of our future advance both socially and as a learned profession. If we can only show that a knowledge of the exact sciences is conducive to our interest commercially, I feel sure that even Mr. Greaves will no longer withhold his support from a system otherwise so desperately refining and effeminate!

For success in the practice of any profession two kinds of qualification are necessary; the acquaintance with men and manners without which profitable and agreeable relations

with unprofessional persons cannot be maintained; and the special knowledge and experience belonging to the profession. On the former head, every one, of course, is agreed; no one who is thoroughly unbusinesslike in habits or unacquainted with human character can succeed in practice, however great his special knowledge may be; it is on the second point that we find so many and such lamentable differences of opinion; it is as to the kind and amount of *special* knowledge necessary for veterinary students that the veterinary profession is so injuriously divided. If it can be shown that the acquiring of a high special education makes a man less able to cope with his fellow-men in business, or less apt in doing the coarser parts of his professional work; then, *as a matter of business*, it might be true that the man of lower education would be in the best position. I think, however, that the habit of judging entirely by the light of previous examples in our own profession might with advantage give way to some extent, and be replaced by comparisons with other learned professions, in some of which if it is not true that worldly success can be measured exactly by technical knowledge, it is certainly the case that many very learned individuals attain high social positions. This is certainly often the case in the medical profession.

Moreover, I think it is not difficult to prove that in the veterinary, as in other professions, all technical knowledge must in the long run be profitable. If our knowledge of the conditions of health and disease in the domesticated animals at the present time was complete, even then no one I suppose would deny that, *other things being equal*, the man who had the most perfect knowledge of everything connected with the health and disease of animals, would succeed best in practice. This proposition is so obvious that one is almost ashamed to put it upon paper; and yet if we analyse this necessary knowledge of health and disease into its proper subdivisions, we find that a number of these subdivisions are rejected at once as useless or even injurious, by many of the most "successful practitioners." But, in fact, our acquaintance with health and disease is very far from complete; does it not, therefore, much more behove us to gain all the knowledge we can on these matters both for our present success and for our future advance in the right prevention, alleviation, and cure, of disease? Of course every one says "Yes," at once; and yet if we put the question in another form and say, ought we not to know all about the natural and acquired habits of our animals, and every means and appliance for preventing and relieving their diseases, and every-

thing about the structure, and composition, and uses of all parts of their bodies? then many of us, *in fact*, give a very different answer. We are ready to admit the great importance of rightly appreciating every improvement in the ways and means of treatment and cure; we insist rightly enough on the paramount necessity of knowing what to do and how to do it; but we seem to forget that improvements in the veterinary *art* are comparatively useless without improved knowledge of the chemistry, anatomy, physiology, and pathology of animals, and of the conditions under which they live. We reject anything like adequate advance in the knowledge of these sciences, because we are too short-sighted to see that in their thorough cultivation lies one of the most indispensable conditions of lasting professional success, success as regards patients and, therefore, as regards money.

If successful practitioners could only believe that they might have been even more "successful," and would certainly have been more "efficient" had a year or two, or even three been spent in working at veterinary science, *in addition to* the three or four years' apprenticeship in the veterinary art, then we might have a reasonable hope of some day seeing our profession at its proper level both scientifically and socially. If we could look forward for fifty years we should find that, on the average, those men were most respected in the profession, and had best reason to be satisfied with their own success, who had in early life received the best technical and general education.

EDUCATION OF THE VETERINARY SURGEON.

By G. Whincop, M.R.C.V.S., Lowestoft.

1*st. Player.*—I hope we have reformed that indifferently with us.
Hamlet.—O, reform it altogether.—Hamlet, Act 3, Sc. 2.

Veterinary surgeons who have the success and advancement of their profession at heart cannot but feel a great interest in the discussion which is going on in the pages of the *Veterinarian* relative to the amount of education required to lift our profession out of the doubtful position it occupies at the present time.

It cannot be denied that the majority of its members are of a phlegmatic class, content to move on, year by year, alike

indifferent to educational advancement, or the social advantages which education brings. Even upon such men as these the startling questions raised by Mr. Thomas Greaves should produce an effect.

Now is the time to speak. Are we as a body to sink because some refuse to buffet with the tide? Mr. Greaves has probed with no nervous hand, but still he has laid everything bare. Too much so, I fear, to be "dulcet music" to the ears of many. But this is not a time for squeamishness? Let the matter be brought honestly forward, that it may be fully and fairly discussed.

Clause 4 in Mr. Greaves' communication is indeed startling to contemplate. Forsooth, because a man has a scientific and classical education, must he throw up his profession in disgust? Take the underpaid curate, or Government schoolmaster; these men are highly educated, but badly paid, and often neglected by the public. If we grumble, how much more so may they?

That the education of the veterinary surgeon is not what it ought to be, and that there are many illiterate men holding the diploma of the College, none can deny. Then, again, the unqualified portion of the profession keep us from advancing, and, unfortunately, the habits of some of our own members too. But it must be a good flock that has not tainted wethers in it.

The preliminary examination held at the College is that which we want first to strike at with a view to its improvement. In its present form it is totally insufficient—I had almost written that its existence was a farce. Few, I think, who have been subjected to it will be found to deny this statement. Let there be a sound examination in English, writing, mathematics, grammar, and geography, and better things will soon come. It would not do, perhaps, for the pecuniary welfare of the institution to wrench the screw too tightly all at once, but at the beginning of each session give it another turn. Thus insensibly we should progress; for young men, knowing that an examination is required of them—those at all events who "mean business"—would prepare for it before they come to the metropolis. That a classical education is not strictly essential to make a good veterinary surgeon none will deny, but that a man having a classical education should be disgusted, because he has to ball or bleed a horse I for one have yet to learn.

Pathological Contributions.

THE SIBERIAN CATTLE PLAGUE.

We learn that this disease is again becoming very rife in Russia, especially along the course of the navigable rivers of the north, where large numbers of horses are employed in towing the barges during the time the passage is free from ice. The Emperor, with a view to the mitigation of the evil, has sent commissions of veterinary surgeons into the infected districts. He has also appointed special commissioners to inquire into the causes, development, and spread of the plague, and the means to be adopted for its immediate suppression on its making its appearance in any fresh district. The Siberian plague appears to be a carbuncular disease which affects man as well as the lower animals. It is described as being espccially fatal to horses and cattle. Last year it swept away some thousands of animals, and this ycar it promises to be as widely diffused. The disease has often shown itself in Germany and other parts of the continent of Europe, but the losses it has caused have, as a rule, not equalled those sustained by Russia.

PROGRESS OF PLEURO-PNEUMONIA.

During the past month we learn that pleuro-pneumonia has been greatly on the increase, and that in many parts of the country the attack has proved fatal in nearly every case. In a fcw instances the progress of the malady has been checked by the adoption of prophylactic measures, but in a large majority these means have singularly failed to be of benefit. In a very recent outbreak in a herd of sixty animals, upwards of forty have succumbed to the disease, and fresh cases are occurring from day to day, so that it is feared but few if any of the animals will ultimately be spared. We have again to ask the inspectors to kcep us well informed on this subject. More legislation is absolutely rcquired with regard to contagious cattle discases, and this will only be cffected by keeping public attention alive to the importance of the matter.

COMMUNICABILITY OF THE MOUTH AND FOOT DISEASE.

Mr. Priestman has communicated to us the following particulars of the extension of mouth and foot disease from pigs to cattle.

About the middle of last May, Mr. Hartwell, of Dalston, observed that some of his pigs were affected with mouth and foot disease; the animals all recovered. Shortly afterwards, towards the middle of June, the disease appeared among another lot of pigs in the same premises, and from them it extended to his cows, seven of which were attacked by the end of the month. The affection was next communicated to cattle in another establishment in a very remarkable manner. Immediately before the second lot of pigs were attacked in June, at Mr. Hartwell's place, Mr. Brown, of Stoke Newington, sent two sows to Mr. Hartwell's boar; the animals remained for two days, and almost as soon as they returned home they showed symptoms of mouth and foot disease. Very soon afterwards five cows belonging to Mr. Brown were also attacked. The extremely infectious character of the malady will readily account for its extension from one class of animal to another; but the circumstance connected with the two cases above recorded are certainly very instructive, and indicate the existence of a hitherto unsuspected cause of the mouth and foot disease in cows.

SUCCESSFUL CASES OF TENOTOMY—AMPUTATION OF A SUPERNUMERARY LIMB.

Mr. Arthur Holl, Veterinary Student, New Beckenham, Norfolk, has sent us the particulars of two cases in which he had divided the flexor tendons of the near fore-limb. The first case arose out of an attack of rheumatismal inflammation of the joints. The patient was a thorough-bred yearling filly. The other case had its origin in disease of the feet; it was a long-standing one, and the animal was perfectly useless. He was operated upon experimentally, having been sent to the kennel to be killed for the hounds. Neither of the cases required anything beyond ordinary dressing of the wound after the operation. The limb of the filly is straight,

and so also is that of the horse. The latter has been enabled to resume his work on the farm.

Mr. Holl likewise informs us that he had been called to a foal, about ten days old, which had a supernumerary leg growing from the central part of the metacarpal bone of the near fore-limb. This he had removed, and the condition of the parts gave promise of very little blemish ultimately existing.

HYDATIDS IN THE BRAIN OF SHEEP.

Our opinion has within the last fortnight been sought with reference to a serious loss which is taking place in a large flock of sheep, from the existence of hydatids within the brain. The sheep are of various ages, and, being half-bred Merinos, they have been bred in and in for a few past years. The owner is inclined to attach much importance to this, as it has produced a great delicacy of constitution. If acting prejudicially, it can only be by the laxity of fibre favouring the passage of the embryonic hydatids in their passage to the brain. In a sheep sent to the College four very large hydatids—two in each hemisphere—were so placed with regard to the pressure on each half of the brain, that the animal did not show any tendency to turn to either side, but had a reeling gait when walking. The head was carried a little to the right side, and there was some evidence of stupidity, but none of impaired vision. Our knowledge of these hydatids is now accurate enough, and shows that preventive means alone—that is, destroying them and the tape-worms, of which they are the scolices, forms the best means of lessening the evil.

LUSUS NATURÆ.

Mr. Gibbs, Herne Bay, has forwarded to us a somewhat rare *lusus naturæ*, which he removed from a cow. In its leading features it is identical with one received a short time since from Mr. Helmore, M.R.C.V.S., Stratford. Arrestation of development of the abdominal and thoracic parietes had taken place, by which the viscera were freely exposed to view. In Mr. Gibbs's case delivery was effected, but in the other, the cow had to be killed, as all the efforts to remove the monstrosity were unavailing.

Mr. Gibbs informs us that he felt the heart pulsating when first called to the case, and that it soon ceased to act. Probably by far the larger number of monsters, in all animals, are living up to the time of parturition. Many we know are born alive. This form of *lusus* is not unfrequently met with in cows, but is very rare in other animals. The causes of this do not appear to be well understood.

Facts and Observations.

Butchers' Meat from Australia. — New South Wales owns more than 20,000,000 of sheep, and cannot consume anything like the yearly produce; but a process of preserving meat has been discovered, and practical experiments are now in course of trial. A cargo of at least 300 tons of mutton and beef will be shipped at Sydney for the English market, and may be expected to arrive in London by September. The calculation of the commercial promoters of the scheme is, that the transport to this country will cost a penny per pound, leaving a handsome margin for profit upon the prices of meat in the colony.

A result of Hippophagy in France.—To the increase in the value of horseflesh in France must, no doubt, be attributed the issue of a recent circular from the War Office in Paris, giving stringent instructions on the subject of bringing to account the sums received for the carcases of slaughtered cavalry horses. The amounts thus realised are to be placed to the shoeing and harness fund, one of the numerous regimental funds or "masses" which exist in the French army. Another clause of the circular directs that equal care is to be taken of money received for the *dépouilles* of dead animals. A joint of dead troop-horse would certainly be a formidable *pièce de resistance*.—*Pall Mall Gazette.*

Vegetable Organisms in Smallpox Lymph.—In lymph obtained from a case of smallpox Ernst Hallier states that he found numerous microscopic cells far more abundant than he had found them in vaccine or in sheep-pox lymph. Magnified 800 times, they appeared distinct rounded bodies moving about, and here and there attached in large numbers to lymph corpuscles. He had also observed many fine threads. He states also that his cultivation experiments, in regard to the lymph from ovine and vaccine pock, have always produced the same characteristic organisms.

Discovery of Vegetable Organisms in the Lymph of Sheep-pox. — Professor Dr. Hallier and Docent A. Zuern of Jena affirm they have found in the lymph of sheep-pox very fine threads and small bodies, the latter moving actively. Similar bodies were found in the vaccine lymph. Examination of sheep-pox in process of development showed the whole tissue full of small nucleated cells. The different elements of the epidermis showed these nuclei in great quantity, and very fine threads.

Development of Bacteria.—M. Béchamp, in a note, which was read to the *Académie des Sciences* on May 4, entered into a long account of the developmental relations of *Bacteria* and *Mycrozymæ*. Indeed he considered the latter to be the first stage of the former. The *Mycrozymæ* are normally simply minute spherical bodies. In this state they exist normally in the human body. But when the tissues are exposed to the air they grow into chains and become *Bacteria*. MM. Béchamp and Estor seem to think it a proof of these *Bacteria* being normal constituents of the body, that they are found in the liver. But after all, what is to prevent any organic germs from reaching the inmost centre of the liver, through the mouth, stomach, and gall duct?

The Strength of Rattlesnake-poison. — Dr. Mitchell, who has conducted numerous experiments upon the strength and properties of this poison, states the following conclusions:—1. One fourth of a drop of the venom is fatal to pigeons under the age of four months. One eighth of a drop is frequently a fatal dose. 2. The venom is absolutely harmless when swallowed, because (*a*) it is incapable of passing through the mucous surfaces (*b*); it undergoes change during digestion, which allows it to enter the blood as a harmless substance, or to escape from the digestive canal in an equally innocent form. 3. Twenty-four hours after it has been swallowed, the contents of the bowel contain no poison. 4. The rectum of the pigeon does not absorb the venom, and it causes no injury when placed on the conjunctiva of animals. 5. The venom passes through the membranes of the brain, and more swiftly through the peritoneum and pericardium. 6. When the venom passes through the peritoneum it so affects the walls of the capillaries as to allow of their rupture, and of the consequent escape of blood. The same phenomena appear on the bare surface of muscles thus poisoned.

THE VETERINARIAN, AUGUST 1, 1868.

Ne quid falsi dicere audeat, ne quid veri non audeat.—CICERO.

THE NECESSITY FOR UNANIMITY AMONG THE MEMBERS OF THE VETERINARY PROFESSION.

IT is somewhere recorded that "familiarity breeds contempt," and observation seems to add some weight to the saying. Certainly a "wise saw," although it may include a precept which commends itself to the judgment of all well regulated minds, often tacitly sanctions a practice, which is directly opposite to its teachings, and if therefore our motto, *vis unita fortior*, might seem to an unprejudiced looker-on to mean a plea for want of unanimity, it would probably occur to him that the difference between the classical meaning and the practical interpretation of the sentence, was not remarkable or unusual, however much he might question the wisdom of allowing such a discrepancy to continue. Just at present there seems too good reason for inquiring into the causes which have resulted in a practical disregard of the watchword which we, as a profession, have chosen to distinguish the act of incorporation. A review of our history from the date of the Charter will afford very few instances of stirring events, and those few will be found not at all of the character which will redound to the credit and advancement of a new and struggling profession. Whenever an energetic movement has taken place among the members of our body, it has nearly always been in the way of disruption instead of union; our way has been in reality separation, and notably within a few years we have exhibited the spectacle of a profession, small in numbers, wanting in influence, and yet hardly on the road to success, deliberately deciding to divide itself into two portions, well knowing that even in combination its moral force was unequal to sustain a persistent onward movement in the face of opposition. Happily for everybody concerned—happily for the very idea of a veterinary pro-

fession, the attempt has not succeeded. After due consideration, the advisers of Her Majesty have failed to see the necessity for a separate Charter for incorporation of the Scotch section of the profession, and have therefore declined to recommend that it be granted. Upon this determination of their Lordships we have no comment to make; our own views of the question are well known, and it cannot be otherwise than satisfactory to us that the decision of the Government is in accordance with the arguments which we have always urged in the best interests, we believe, of the profession.

One essential element of discord is at the base of all the disagreements which have interrupted our progress and effectually opposed all necessary reform. It is not to active malevolence that any of our misfortunes as a profession are due, but to passive indifference; in default of a few patriotic members we should utterly stagnate. These, however, make an onward move, and forthwith stimulate a number of scarcely interested but amiable friends to assist them in their efforts. If some restless mind sees a short cut to a great success in a novel and startling act, he also finds for the time aid from many, who do not see the good to be gained, but take no care to contest the point, having personally more important, to them, matters to engage their attention. Had it not been for this want of interest in Veterinary politics we should long ere this have supplemented our Charter, advanced our educational and social status, and proportionately increased our influence. As it is we have done nothing beyond cavilling about the choice of the thing to be done, and the proper manner of doing it. An excellent opportunity now presents itself for retrieving lost ground; so little having already been effected is a reason the more for a strenuous effort to achieve something, at least of the work that remains to be fulfilled. For the present at least the question of two Charters may be left in abeyance while we consider what can be done to carry out to their full extent of possible development, the objects of the one we have. Whatever there may be of actual disabilities affecting any members, whether few or

many in the Profession, can surely be removed. If the very limited privileges which the corporate body enjoys are unequally distributed they are susceptible of a re-adjustment. In fine, whatever there may be of wrong can be rectified without a resort to the radical expedient of disunion,—a course which would be not only unwise, but so far as the intended object is concerned abortive, not only fallacious in result, but calculated to inflict upon the whole profession a shock from which it would take years to recover, even if its prosperity were not permanently obstructed. On the other hand, as a united profession we may devote ourselves to a struggle for the attainment of a legitimate position with every prospect of ultimate success. The force which has been wasted in mutual opposition might be exercised and concentrated upon a common object —the progress of Veterinary Science. Hitherto our efforts to obtain from the legislature what would amount to a recognition of our professional status, have not been successful, but recent events have proved that the profession is slowly but certainly forcing itself upon public attention. The important questions of cattle transit, and the spread of contagious diseases have been discussed to a sufficient extent to make it evident that competent Veterinary advisers and efficient Veterinary inspection are in request, and not only so, but are likely to become important in direct ratio to the progress of an advancing agriculture, and the development of an extended system of food production both in relation to home bred and imported stock. It is open to us to accept or decline the present favourable position but we feel it our duty to remark, that the renewal of an unnecessary contest will assuredly be to our public prejudice, while an honest, and what is equally essential, an unanimous, effort in the right direction will effect much, if it does not gain for us all we seek.

On the good sense and good feeling of the members of the Veterinary profession we rely for a practical exemplification of the motto, "*Vis unita fortior.*"

APPOINTMENT OF PROFESSOR BROWN AS AN EXAMINER.

It will be seen by reference to the report of the Royal College of Veterinary Surgeons that the Council at its sitting on July 8th had to fulfil one of the most responsible duties with which it is entrusted—namely, the election of a member of the Court of Examiners. The vacancy to be filled was that which had been occasioned by the death of our much to be regretted friend and colleague, Professor Morton. Our readers need scarcely to be reminded that Professor Morton had been specially appointed to examine on materia medica and therapeutics, and that it was most important that the section of the court with which he had acted, should not be weakened by his demise. This circumstance added to the difficulty before the council, but by the selection it has made, not only will there be no weakening of this section of the court, but each of the other divisions of it will be kept equally as efficient as it now may be, should the new examiner sit at any other table or have to supply the temporary absence of any of the members. This being so, we may congratulate the council on its choice. Professor Brown, of the veterinary department of the Privy Council office, will take his place in the court, to the satisfaction of the entire profession. He brings with him a profundity of knowledge, and a capability of testing the acquirements of the student which is possessed by few amongst us. As a teacher of veterinary science, he was for many years attached to the Cirencester Agricultural College. As an author he has published a text-book on pharmacy for the use of the students at the Agricultural College; an 'Essay on Therapeutics;' and in conjunction with Dr. Harley, 'A Guide to the Microscopical Examination of the Animal Tissues in Health and Disease.' He also assisted the late Professor Morton in the preparation of the *sixth edition* of his 'Manual of Pharmacy,' by translating articles from the standard works of German authors, and undertaking to conduct experiments for further determining the action of certain

medicinal agents. No better man could have been found, nor one who will more honestly perform his duty.

It would have been more in accordance with our feelings could we have stopped here, and not have added to these remarks; but justice to the profession, to the council, and to ourselves as editors of an independent journal, alike require that we should allude to a circumstance upon which the official report is perfectly silent. Why this matter should have been suppressed in the report we know not, nor do we now care to inquire. We have simply to deal with the facts. Well, just after the balloting box had gone round, and all the balloting papers had been deposited in it, two members of the council entered the room whose countenances at once denoted that they were ill at ease both with themselves and with others. Even before taking their seats, one of them began to loudly complain of undue haste in proceeding to the election of an examiner, and of the shortness of time he had received his notice of the meeting. He added, also, that there were a dozen men at least who were in every way qualified for the post. Finding but little sympathy from the council, and receiving replies which proved there was no just ground for his complaints, an attempt was made to postpone the taking the decision of the meeting, which, however, fortunately for the movers in the matter, did not succeed.

Had the too apparent object been accomplished, we are assured that there were those present who would immediately have entered their protest, as the first step towards obtaining a *mandamus* calling on the president and council to show cause why, when all the balloting papers had been deposited in the box, and been handed to the president, the result of the election was not officially declared. As a body the council rightly abstained from taking part in the *fracas*. By its silence and forbearance it marked its sense of the transaction. For the sake of the authors themselves of this unseemly and questionable proceeding we hope never to witness such another scene. Obstructiveness to progress in our profession must give way. Advance must be made. The powers that rule, be they whom they may, must re-

member that we are not living in do-nothing times. Their individual efforts to put on the drag, as well as the use of their influence to induce others to do the same, will only end in their own discomfit and disgrace. If they desire to fight they should remember that guns must be captured before they can be spiked. The public has willed that as a profession we should give a good account of ourselves, and the *vox populi* will prove as irresistible in this as in all other matters which affect its best interests.

The official report states that Professor Brown was unanimously elected, which, however, is not literally true, as the gentlemen alluded to declined to vote, either for or against him. The election was otherwise unanimous, every member of the council feeling that the name of the right man was before them.

THE COUNTRY MEETING OF THE ROYAL AGRICULTURAL SOCIETY.

The meeting of the Royal Agricultural Society, which has just been held at Leicester, has proved in every respect a most successful one. The number of persons entering the show yard, and the sums received for admission, place the meeting very high in the scale when compared with any which have preceded it. The one held at Bury St. Edmund's last year is completely eclipsed by it. Strange as the fact may at first sight appear, the meetings which have been held in purely agricultural districts have invariably failed to turn out advantageously to the Society's immediate benefit. Indeed, heavy pecuniary losses have often had to be borne. The cause of this is to be found in the thinness of the population, and not in want of zeal on the part of agriculturists.

Now that the coffers of the Society are replenished and are likely to be even more enriched by the forthcoming Manchester meeting, we may hope to see its liberality keeping pace with its income. There are many things still to be done in the cause of those sciences which bear

directly upon agriculture. Success in practical farming mainly depends on a knowledge of collateral sciences, and not a little on an acquaintance with the science of Veterinary medicine. We hope to see the Society doing far more than merely giving an annual grant to the Royal Veterinary College. So far as this goes it is well; but much more is needed to give a status to the Veterinary surgeon in rural districts. His means of living are frequently frittered away by the cowleech and the farrier, and often he receives but little assistance from the resident members of the Society. There are now few districts to be found in which a Veterinary surgeon, well versed in the diseases of cattle and sheep does not reside, and these men should have the support and patronage of the Society. Something of this kind will do much to advance the Veterinary profession.

We hear a good deal of the necessity of bringing better educated men into the profession. So fully does this object accord with our views that we have spared no pains to effect it, nor shall we cease to agitate the question until its end be accomplished. Veterinary surgeons, however, do not alone need this better education. Farmers themselves as a body are woefully behind the rest of the community. The views of many are so contracted that they only look upon an animal out of health, as of a plough out of repair, which must needs be sent to the country blacksmith to be mended. These men are the supporters of cowleeches and farriers, and ever will be until they become better informed. The Society has much work before it, and it must keep its shoulder honestly to the wheel. It has laid the foundation of a better education of the farming classes, and year by year it must build thereon.

Subjoined is the award of the stock prizes at the Leicester meeting. Its perusal will show that the several classes were well represented. The competition was strong, and only first-class animals carried away the honours. The show was grand in every division of it. By far the larger number of the horses, cattle, sheep, and pigs, for their purity of breed, and beauty of symmetry, were never surpassed, although in some of the classes the entries have been more numerous.

Our space will not allow of individual, or even class criticisms to be made. Indeed, where all was so good, there is little occasion for this being done, and more especially in a journal like ours which is devoted more immediately to the science of medicine than to the science of agriculture.

AWARD OF THE PRIZES AT THE MEETING OF THE ROYAL AGRICULTURAL SHOW AT LEICESTER.

HORSES.

ALL AGES CALCULATED TO JULY 1ST, 1868.

CLASS 1.—*Agricultural Stallion, foaled before 1st January*, 1866.

3. First Prize, £25, to Wm. Welcher, of Upwell, Wisbeach, Cambridgeshire, "Honest Tom," bay, 3 years old, bred by Exhibitor.
5. Second Prize, £15, to Earl Beauchamp, of Madresfield Court, Malvern, Worcestershire, "Young Lofty," bay (Clydesdale), 7 years old, bred by Mr. S. Clark, Manswrae, Kilbarchan, Renfrewshire.
9. Third Prize, £5, to John Edmondson, of Entwistle, Burnley, Lancashire, "Young Sampson," dark brown, 4 years old, bred by Messrs. Fitton and Rawstron, Stoneycliffe, Middleton, Manchester.
6. Reserve, John Henderson, of Horsley Hill, South Shields, County Durham, "Victor," Brown, 3 years old, bred by Exhibitor.

CLASS 2.—*Agricultural Stallion, foaled in the year* 1866.

17. First Prize, £20, to Henry Hitchcock, of Chittern Allsaints, Heytesbury, Wilts, "Lion," grey roan (Wiltshire), 2 years old, bred by Exhibitor.
18. Second Prize. £10, to John Manning, of Orlingbury, Wellingborough, Northamptonshire, "Conqueror," dark brown, 2 years old, bred by Mr. D. Hipwell, Maidwell, Northampton.
13. Third Prize, £5, to Her Majesty the Queen, Windsor Castle, "Sandy," bay (Clydesdale), 2 years old, bred by Her Majesty.
16. Reserve and Highly Commended, Thomas Middleton, of Lyddington, Uppingham, Rutlandshire, "Rutland Hero," dark brown, 2 years old, bred by Mr. Scott, Carlton, Rockingham, Northamptonshire.
21. Commended, Robert Green Salmon, of Great Clacton Hall, Colchester, Essex, "Major," bay (Essex and Suffolk), 2 years old, bred by Exhibitor.

CLASS 3.—*Suffolk Stallion, foaled before the 1st of January*, 1866.

28. First Prize, £25, to William Wilson, of Baylham Hall, Ipswich, "The President," chesnut, 3 years old, bred by Mr. J. A. Piggott, Beckingham Hall, Witham, Essex.
25. Second Prize, £15, to Thomas Crisp, of Butley Abbey, Wickham Market, Suffolk, chesnut, 3 years old, bred by Mr. Frewer, Debenham, Suffolk.
26. Third Prize, £5, to Thomas Crisp, of Butley Abbey, "Cupbearer," chesnut, 4 years old, bred by Mrs. Sargent, Marlesford, Wickham Market.

24. Reserve and Highly Commended, Manfred Biddell, of Playford, Ipswich, "Punch," chesnut, 4 years old, bred by Mr. Frost, Shadingfield, Beccles, Suffolk.
27. Commended, Thomas Crisp, of Butley Abbey, chesnut, 7 years old, bred by Mr. Bromley, Wickhambrook, Newmarket.

CLASS 4.—*Suffolk Stallion, foaled in the year* 1866.

32. First Prize, £20, to George David Badham, of Bulmer, Sudbury, Suffolk, "Fitz-Emperor," chesnut, 2 years old, bred by Mr. Dupons, Sudbury.
34. Second Prize, £10, to Wm. Wilson, of Baylham Hall, Ipswich, Suffolk, chesnut, 2 years old, bred by Mr. Sprawle, Stonham, Suffolk.
31. Third Prize, £5, to Isaac Rist, of Tattingstone, "Young Champion," chesnut, 2 years old, bred by Sir Edward Kerrison, Bart., Brome Hall, Scole, Suffolk.

CLASS 5.—*Thorough-bred Stallion, suitable for getting Hunters.*

39. First Prize, £100, to Sir George Cholmley, Bart., of Newton Rillington, Yorkshire, "Angelus," chesnut, 8 years old, bred by Exhibitor.
43. Second Prize, £50, to William Gulliver, of Swacliff, Banbury, Oxfordshire, "Naseby," bay or brown, 20 years old, bred by Mr. S. Davis, Swerford Park, Chipping Norton.
45. Third Prize, £10, to Earl Spencer, K.G., of Althorp, Northampton, "General Hesse," chesnut, 11 years old, bred by Mr. Wyatt, Nutbourne, Emsworth, Hants.
38. Reserve, Oswald Baynes, Pawnall Hall, Stockport, Cheshire, "Lancer," bay, 3 years old, bred by Mr. E. Worthington, Heald Green, Wilmslow, Cheshire.

CLASS 6.—*Stallion, not less than* 14 *hands* 2 *inches nor exceeding* 15 *hands* 2 *inches, suitable for getting Hackneys.*

48. First Prize, £25, Charles Beart, of Stow Bardolph, Downham Market, Norfolk, "Ambition," red roan, 5 years old, bred by Exhibitor.
47. Second Prize, £15, to Frederick Barlow, of Hasketon, Woodbridge, Suffolk, "Lucifer," black brown, 6 years old, bred by Exhibitor.
50. Third Prize, £5, to William King, of North Luffenham, Stamford, Rutlandshire, bay or brown, 4 years old, bred by Exhibitor.
49. Reserve, Charles Beart, of Stow Bardolph, red roan, 6 years old, bred by Exhibitor.

CLASS 7.—*Stallion, not less than* 16 *hands, suitable for getting Coach-horses.*

(No Entry.)

CLASS 8.—*Pony Stallion, under* 14 *hands* 2 *inches.*

55. First Prize, £20, to Joseph Baldock, of Cropwell Butler, Bingham, Notts, "Little Jack Horner," chesnut, 5 years old, bred by Exhibitor.
58. Second Prize, £10, to Charles Groucock, of Stanfield Hall, Wymondham, Norfolk, "King Arthur," chesnut, 8 years old, breeder unknown.
57. Third Prize, £5, to Andrew Doyle, of Plâs Dulas, Abergele, Denbighshire, "Tramp," brown (Welsh), 4 years old, bred by Exhibitor.
54. Reserve, The Marchioness of Hastings, of Donnington Park, Derby, "Bobby," brown (Highland), aged, breeder unknown.

CLASS 9.—*Hunter, Mare or Gelding, not less than five years old.*

69. First Prize, £50, to Edmund Hornby, of Flotmarley, Ganton, Yorkshire, "Lady Derwent," bay (mare), 5 years old, bred by Thomas Cordmer, Hesberton, Yorkshire.
62. Second Prize, £25, to Captain E. N. Heygate, of Buckland, Leominister, "Mountain Dew," dark brown (gelding), 6 years old, bred by Exhibitor.
78. Reserve, William Gilford, of North Luffenham, Rutlandshire, bay (gelding), 5 years old, bred by Mr. Myers, Gletton, Uppingham.

CLASS 10.—*Hunter, Mare or Gelding, four years old.*

86. First Prize, £30, to John B. Booth, of Killerby Hall, Catterick, Yorkshire, "Brigadier," dark brown (gelding), bred by Mr. W. Clark, Killerby, Darlington.
91. Second Prize, £15, to John Drage, of Moulton Lodge, Northampton, "Gay Lad," brown bay (gelding), bred by Mr. Dainty, Thorpe Malsor, Kettering.
82. Reserve, William Higgins Potterton, of Boughton Grange, Northampton, black (gelding), bred by Exhibitor.

The Class Commended.

CLASS 11.—*Mare, in foal, or with foal at foot, suitable for breeding Hunters.*

100. First Prize, £25, to John Byron, of Kirkby Green, Sleaford, Lincolnshire, "Maid of the Heath," chesnut (with foal), aged, breeder unknown.
96. Second Prize, £15, to Captain E. N. Heygate, of Buckland, Leominster, Herefordshire, "Whisky," dark brown (with foal), 14 years old, bred by Mr. Doggs, Annan, Dumfriesshire.
101. Third Prize, £5, to John Thomas Robinson, of Leckby Palace, Topcliffe, Thirsk, Yorkshire, "Go-a-head," dark bay (with foal), 10 years old, breeder unknown.
93. Reserve, John Borlase Tibbits, of Barton Seagrave, Kettering, "Queen of the Vale," bay (with foal), 12 years old, bred by Mr. W. Bayliss, Hogston, Aylesbury.

CLASS 12.—*Mare, not less than* 14 *hands* 1 *inch, nor exceeding* 15 *hands* 1 *inch, in foal, or with foal at foot, suitable for breeding Hackneys.*

111. First Prize, £20, to Francis Cook, of Thixendale, York, "British Queen," bay (with foal), 10 years old, bred by Exhibitor.
110. Second Prize, £10, to William Solomon Woodroffe, of Normanton-on-Soar, Loughborough, Leicestershire, "Gipsy," chesnut (with foal), aged, breeder unknown.
109. Third Prize, £5, to Alfred Robert Howland, of Ludesdon House, Thame, Oxon, "Poll," brown, with (foal), 21 years old, bred by Mr. T. Parsons, Waterstock, Wheatley, Oxon.
112. Reserve, Edward Bailey, sen., of Barkby, Leicester, "Black Fanny," black (with foal), 20 years old, bred by Exhibitor.

CLASS 13.—*Hackney, Mare or Gelding, not exceeding* 15 *hands* 1 *inch, four years old and upwards.*

127. First Prize, £20, to Algernon Hack, of Buckminster, Grantham, Lincolnshire, bay (gelding), 7 years old, bred by Exhibitor.

122. Second Prize, £10, to Frederick Wollaston, of Shenton Hall, Nuneaton, Leicestershire, "Eric," chesnut (gelding), 5 years old, bred by Mr. Swan, Barwell Fields, Hinckley.
117. Reserve, Mrs. Baillie, of Illston Grange, Leicester, "Birthday," brown (mare), 6 years old, breeder unknown.

CLASS 14.—*Cob, Mare, or Gelding, not exceeding* 14 *hands* 1 *inch, four years old and upwards.*

138. First Prize £20, Charles Groucock, of Stanfield Hall, Wymondham, Norfolk, "Champagne Charley," grey (gelding), 7 years old, breeder unknown.
135. Second Prize, £10, John Warth, of Sutton, Ely, Cambs. "Zingara," red roan (mare), 5 years old, bred by Mr. W. Flanders, Littleport, Ely.
137. Reserve, Sir Arthur Grey Hazlerigg, Bart., of Noseley Hall, Leicester, "Rannoch," grey (gelding), 6 years old, bred by Exhibitor.

CLASS 15.—*Pony Mare, not exceeding* 14 *hands.*

141. First Prize, £15, John Warth, Sutton, Ely, Cambs., "Matchless," dark chesnut, 5 years old, bred by Mr. W. Cockle, Aldreth, Ely, Cambs.
139. Second Prize, £10, Frederick Barlow, of Hasketon, Woodbridge, Suffolk, "Piccadilly," black, 7 years old, breeder unknown.
146. Third Prize, £5, Charles Groucock, of Stanfield Hall, Wymondham, Norfolk, "Pretty Susan," bay, 7 years old, breeder unknown.
143. Reserve, Richard Milward, of Thurgston Priory, Southwell, Notts., "Alice," bay, about 4 years old, breeder unknown.

CLASS 16.—*Agricultural Mare and Foal.*

155. First Prize, £20, to William Tennant, of Barlow, Selby, Yorkshire, "Jet," black, 12 years old, bred by Mr. K. Burton, Cliff Selby.
153. Second Prize, £10, to John Gray Attwater, of Britford, Salisbury, "Violet," chesnut, age and breeder unknown.

Third Prize, £5, no competition.

CLASS 17.—*Suffolk Mare and Foal.*

156. First Prize, £20, to Samuel Wolton, jun., of Kesgrave, Woodbridge, Suffolk, "Violet," chesnut, 6 years old, bred by Exhibitor.

Second Prize, £10, no competition.

Third Prize, £5, no competition.

CLASS 18.—*Agricultural Filly, two years old.*

161. First Prize, £15, to Robert Marple, of Aston-on-Trent, Derbyshire, chesnut roan, bred by Exhibitor.
158. Second Prize, £10, to Thomas Baldwin, of Earlswood, Tanworth, Hockley Heath, Warwickshire, red roan, bred by the Executors of the late T. Baldwin, Burnt Green Farm, Bromsgrove.
157. Third Prize, £5, to Her Majesty the Queen, Windsor Castle, "Meg," brown (Clydesdale), bred by Her Majesty.

CLASS 19.—*Suffolk Filly, two years old.*

164. First Prize, £15, to Major Fuller Maitland Wilson, of Stowlangtoft Hall, "Bury Empress," chesnut, bred by Mr. Frost, Stoke, Colchester.
163. Second Prize, £10, to Major Fuller Maitland Wilson, of Stowlangtoft Hall, Bury St. Edmonds, Suffolk, "Violet," chesnut, bred by Mr. Green, Manningtree.

166. Third Prize, £5, to Isaac Rist, of Tattingstone, "Blossom," chesnut, bred by Mr. Bolton, Buxall, Stowmarket.
165. Reserve and Highly Commended, Isaac Rist, of Tattingstone, Ipswich, Suffolk, "Scot," chesnut, bred by Sir E. Kerrison, Bart., Brome Hall, Scole.

CATTLE.

SHORT-HORNED.

Class 20.—*Bull, above three years old.*

182. First Prize, £25, to Thomas Christopher Booth, of Walby, Northallerton, Yorkshire, "Commander-in-Chief," roan, 4 y. 1 m. 1 w. 4 d. old, bred by the late Richard Booth.
176. Second Prize, £15, to Jonathan Peel, of Knowlmere Manor, Clitheroe, Yorkshire, "Knight of Knowlmere," white, 4 y. 9 m. 1 w. 6 d. old, bred by Exhibitor.
173. Third Prize, £5, to William Caless, of Bodicote House, Banbury, Oxton, "Huntsman," roan, 4 y. 7 m. 2 d. old, bred by Exhibitor.
174. Reserve and Highly Commended, George Robertson Barclay, of Keavil, Dunfermline, Fifeshire, "Heir of Englishman," roan, 3 y. 2 m. 2 w. 1 d. old, bred by Exhibitor.
171. Highly Commended, John Lynn, of Church Farm, of Stroxton, Grantham, Lincolnshire, "Prizeman," red and white, 3 y. 11 m. old, bred by Exhibitor.
172. Highly Commended, Francis Hawksworth Fawkes, of Farnley Hall, Otley, Yorkshire, "Friar Bacon," roan, 3 y. 10 m. 3 w. 4 d. old, bred by Exhibitor.
169. Commended, Joseph Pulley, of Lower Eaton, Hereford, "Royal Buck," red, 4 y. 1 m. 2 w. old, bred by Mr. Logan, Maindee, Newport, Monmouth.
187. Commended, Richard Ratcliff, of Walton Hall, Burton-on-Trent, "Gay Lad," roan, 3 y. 10 m. 2 d. old, bred by the late Mr. W. Fletcher, Radmanthwaite.

Class 21.—*Bull, above two and not exceeding three years old.*

196. First Prize, £25, to William H. Spencer Adcock, of Farndish, Wellingborough, Northamptonshire, "Baron Geneva," roan, 2 y. 5 m. 3 w. 6 d. old, bred by Exhibitor.
190. Second Prize, £15, to Lady Pigot, of Branches Park, Newmarket, "Charles le Beau," roan, 2 y. 9 m. 3 w. 2 d. old, bred by Exhibitor.
191. Third Prize, £5, to Thomas Edward Pawlett, of Beeston, Sandy, Bedfordshire, "Baron Warlaby," red and white, 2 y. 9 m. 1 w. 1 d. old, bred by Exhibitor.
193. Reserve and Highly Commended, Hugh Aylmer, of West Dereham Abbey, Stoke Ferry, Norfolk, "General Hopewell," roan, 2 y. 4 w. old, bred by Exhibitor.
194. Commended, Richard Stratton, of Walls Court, Bristol, "James the First," rich roan, 2 y. 7 m. 3 w. old, bred by Exhibitor.

Class 22.—*Yearling Bull, above one and not exceeding two years old.*

201. First Prize, £25, Joseph Meadows, of Thornville, Wexford, Ireland, "Bolivar," roan, 1 y. 2 m. 3 w. 5 d. old, bred by Exhibitor.
205. Second Prize, £15, Lady Pigot, of Branches Park, Newmarket, "Rosalie," roan, 1 y. 7 m. 4 w. old, bred by Exhibitor.
214. Third Prize, £5, Thomas Walker, of Stowell Park, North Leach, Gloucestershire, "The Cotswold Examiner," roan, 1 y. 9 m. 2 w. old, bred by Exhibitor.

208. Reserve and Highly Commended, Francis Hawkesworth Fawkes, of Farnley Hall, "Fra Diavolo," roan, 1 y. 3 m. 3 w. 1 d. old, bred by Exhibitor.
211. Highly Commended, Rev. William Holt Beever, of Pencraig Court, Ross, Herefordshire, "Rose Butterfly," roan, 1 y. 11 m. 3 w. 3 d. old, bred by Exhibitor.
207. Commended, Francis Hawkesworth Fawkes, of Farnley Hall, Otley, Yorkshire, "Lord Belmore," roan, 1 y. 3 m. 1 w. 1 d. old, bred by Exhibitor.
210. Commended, Jonathan Peel, of Knowlmere Manor, Clitheroe, "Baron Beust," roan, 1 y. 5 m. 2 w. 3 d. old, bred by Exhibitor.
221. Commended, the Earl of Radnor, of Coleshill, Highworth, "Orkney," roan, 1 y. 10 m. 1 w. 1 d. old, bred by Exhibitor.
223. Commended, Lord Feversham, of Duncome Park, Helmsley, Yorkshire, "Manchester," roan, 1 y. 10 m. 5 d. old, bred by the late Lord Feversham.

CLASS 23.—*Bull-Calf, above six and not exceeding twelve months old.*

226. First Prize, £10, George Savile Foljambe, of Osberton Hall, Worksop, Notts, "Knight of the Bath," roan, 8 m. 1 w. 3 d. old, bred by Exhibitor.
227. Second Prize, £5, George Savile Foljambe, of Osberton Hall, "Knight of the Crescent," red, 10 m. 2 w. 5 d. old, bred by Exhibitor,
235. Reserve and Highly Commended, Francis Hawkesworth Fawkes, of Farnley Hall, Otley, Yorkshire, "Lord Montgomery," roan, 9 m. 3 w. 1 d. old, bred by Exhibitor.
229. Highly Commended, John Lynn, of Church Farm, Stroxton, Grantham, Lincolnshire, "Grand Sultan," rich roan, 11 m. 1 w. 4 d. old, bred by Exhibitor.
228. Highly Commended, Lord Walsingham, of Merton Hall, Thetford, Norfolk, "Wensleydale," rich roan, 10 m. 2 w. 4 d. old, bred by Exhibitor.

CLASS 24.—*Cow, above three years old.*

253. First Prize, £20, Thomas Christopher Booth, of Warlaby, Northallerton, Yorkshire, "Lady Fragrant," roan, in-calf and in milk, 5 y. 4 m. 1 d. old, bred by the late Richard Booth.
250. Second Prize, £10, James How, of Broughton, Huntingdon, "Jolly Queen," roan, 4 y. 3 m. 2 w. 6 d. old, in-calf and in-milk, bred by Mr. John Logan, Maindee House, Newport, Monmouthshire.
249. Third Prize, £5, Lady Pigot, of Branches Park, Newmarket, "The Queen of Rosalea," roan, in-calf and in-milk, 3 y. 11 m. 3 w. 5 d. old, bred by Exhibitor.
251. Reserve, Robert Tennant, of Scarcroft Lodge, Leeds, Yorkshire, "Miss Farewell," red and white, in-milk, 4 y. 3 m. 2 w. old, bred by Colonel Townley, Townley Park, Burnley.
252. Highly Commended, George Garne, of Churchill Heath, Chipping Norton, Oxon, "Lady Lucy," roan, in-milk and in-calf, 5 y. 7 m. old, bred by Exhibitor.
243. Commended, George Savile Foljambe, of Osberton Hall, Worksop, Nottinghamshire, "Cherry Blossom," white, in-calf, 4 y. 6 m. 4 d. old, bred by Exhibitor.
248. Commended, Sir W. De Capell Brooke, Bart., of Geddington Grange, Kettering, Northamptonshire, "Rose of Raby," roan, in-milk and in-calf 4 y. 10 m. 4 w. old, bred by the late Mr. J. Abbey, Grange, Wellingborough.

255. Commended, Christopher James Bradshaw, of Alstoe, Burnley-on-the Hill, Oakham, Rutlandshire, "Beauty," roan, in-milk and in-calf, 5 y. 2 m. old, bred by Exhibitor.

CLASS 25.—*Heifer, in-milk or in-calf, not exceeding three years old.*

259. First Prize, £15, to Her Majesty the Queen, Windsor Castle, "Alexandra," roan, in-calf, 2 y. 6 m. 2 w. old, bred by Her Majesty.
263. Second Prize, £10, Lady Pigot, of Branches Park, Newmarket, "The Dame of Rosalea," roan, in-calf, 2 y. 11 m. 2 w. 1 d. old, bred by Exhibitor.
260. Third Prize, £5, to Lord Walsingham, of Merton Hall, Thetford, Norfolk, "Thoughtless," light roan, in-calf, 2 y. 3 m. 3 w. 6 d. old, bred by Exhibitor.
264. Reserve and Commended, James Bailey, of North Lodge, Mansfield, Nottinghamshire, "Juanita 2nd," roan, in-calf, 2 y. 1 m. 3 w. 3 d. old, bred by the late Mr. W. Fletcher, Radmanthwaite, Mansfield.

CLASS 26.—*Yearling Heifer, above one and not exceeding two years old.*

276. First Prize, £15, to James How, of Broughton, Huntingdon, "Lady Anne," red and white, in-calf, 1 y. 10 m. 2 w. 2 d. old, bred by Mr. J. Logan, of Maindee House, Newport, Monmouthshire.
282. Second Prize, £10, to Thomas Christopher Booth, of Warlaby, Northallerton, Yorkshire, "Patricia," roan, 1 y. 3 m. 2 w. old, bred by Exhibitor.
279. Third Prize, £5, to George Garne, of Churchill Heath, "Duchess of Towneley," red, in calf, 1 y. 11 m. 1 w. 1 d. old, bred by Exhibitor.
283. Reserved and Highly Commended, Thomas Christopher Booth, of Warlaby, "Lady Gaiety," roan, 1 y. 5 m. 3 w. 5 d. old, bred by Exhibitor.
280. Commended, Robert Tennant, of Scarcroft Lodge, Shadwell, Leeds, "Rose of York," white, 1 y. 5 m. 4 w. old, bred by Exhibitor.

CLASS 27.—*Heifer-Calf, above six and under twelve months old.*

297. First Prize, £10, Lord Penrhyn, of Penrhyn Castle, Bangor, Caernarvonshire, "Waterloo 27th," red, little white, 10 months old, bred by Exhibitor.
300A. Second Prize, £5, Richard Stratton, of Walls Court, Bristol, "Ariel," rich roan, 8 m. 2 w. 4 d. old, bred by Exhibitor.
292. Reserve and Highly Commended, George Savile Foljambe, of Osberton Hall, Worksop, Nottinghamshire, "Flora," roan, 7 m. 2 w. 5 d. old, bred by Exhibitor.
298. Highly Commended, Lord Penrhyn, of Penrhyn Castle, "Waterloo 26th," red and white, 10 m. 1 w. old, bred by Exhibitor.
295. Commended, The Rev. William Holt Beever, of Pencraig Court, Ross, Herefordshire, "Lady Culshaw," red, 7 m. 5 d. old, bred by Exhibitor.

HEREFORD.

CLASS 28.—*Bull, above three years old.*

304. First Prize, £25, to Thomas Rogers, of Coxall, Brampton Bryan, Herefordshire, "Batter Hall," red, white face, 5 y. 11 m. 4 d. old, bred by Mr. T. Roberts, Ivington, Bury, Leominster.

307. Second Prize, £15, to John Williams, of St. Mary's, Kingsland, Leominster, Herefordshire, "Sir George," red, white face, 4 y. 11 m. 2 w. 2 d. old, bred by Mr. B. Rogers, The Grove, Pembridge, Leominster.
303. Third Prize, £5, to Joseph Rawle Paramore, of Dinedor Court, "Dinedor," red, white face, 4 y. 8 m. 2 w. 2 d. old, bred by Exhibitor.
301. Reserve, Her Majesty the Queen, Windsor Castle, "Deception," red, white face, 5 y. 11 m. 1 w. 6 d. old, bred by the late Mr. J. Rea, Monaughty, Knighton, Radnorshire.

CLASS 29.—*Bull, above two and not exceeding three years old.*

309. First Prize, £25, to John Hungerford Arkwright, of Hampton Court, Leominster, Herefordshire, "Sir Hungerford," red, white face, 2 y. 10 m. 1 w. old, bred by Exhibitor.
310. Second Prize, £15, to Thomas Duckham, of Baysham Court, Ross, Herefordshire, "Reginald," red, white face, 2 y. 11 m. 3 d, old, bred by Exhibitor.
311. Third Prize, £5, to James Taylor, of Stretford Court, Leominster, Herefordshire, "Challenge," red, white face, 2 y. 8 m. 4 d. old, bred by Exhibitor.
312. Reserve, William Lort, of The Cotteridge, Birmingham, "King Theodore," red, white face, 2 y. 8 m. 6 d. old, bred by Exhibitor.

CLASS 30.—*Yearling Bull, above one and not exceeding two years old.*

315. First Prize, £25, to William Tudge, of Adforton, Leintwardine, Herefordshire, "Brandon," red, white face, 1 y. 11 m. 1 w. 1 d. old, bred by Exhibitor.
313. Second Prize, £15, to Her Majesty the Queen, Windsor Castle, "Prince Leopold," red, white face, 1 y. 9 m. 1 w. old, bred by Her Majesty.
314. Third Prize, £5, to Joseph Rawle Paramore, of Dinedor Court, Hereford, "Chancellor," red, white face, 1 y. 10 m. 4 d. old, bred by Exhibitor.

CLASS 31.—*Bull-Calf, above six and not exceeding twelve months old.*

317. First Prize, £10, to William Tudge, of Adforton, Leintwardine, Herefordshire, "Landseer," red, white face, 11 m. 2 w. 5 d. old, bred by Exhibitor.

CLASS 32.—*Cow, above three years old.*

321. First Prize, £20, John Hungerford Arkwright, of Hampton Court, Leominster, Herefordshire, red, white face, in-calf, 4 y. old, bred by Exhibitor.
319. Second Prize, £10, to Her Majesty the Queen, Windsor Castle, "Agnes," red, white face, in-milk, 5 y. 2 w. 4 d. old, bred by Mr. James Rea, Monaughty, Knighton, Radnorshire.
324. Third Prize, £5, to Henry Rawlins Evans, Jun., of Swanstone Court, "Stately 2nd," red, white face, in-calf, 8 y. 3 m. 2 w. 1 d. old, bred by Exhibitor.
310. Reserve, Thomas Rogers, of Coxall, Brampton Bryan, Herefordshire, "Gentle Annie," red, white face, in-milk, 3 y. 11 m. 1 w. 3 d. old, bred by Exhibitor.

CLASS 33.—*Heifer, in-milk or in-calf, not exceeding three years old.*

327. First Prize, £15, to Samuel Plimley, of Alderbury, Shrewsbury, red, white face, in-calf, 2 y. 9 m. 3 w. 3 d. old, bred by Exhibitor.
325. Second Prize, £10, to John Prosser, of Honeybourne Grounds, Broadway, Gloucestershire, "White Rose," red, white face, in-milk, 2 y. 8 m. 2 d. old, bred by Exhibitor.
326. Third Prize, £5, to John Prosser, of Honeybourne Grounds, "Carrie," red, white face, in-milk, 2 y. 9 m. 1 w. 4 d. old, bred by Exhibitor.

CLASS 34.—*Yearling Heifer, above one and not exceeding two years old.*

332. First Prize, £15, to John Hungerford Arkwright, of Hampton Court, Leominster, Herefordshire, red, white face, 1 y. 5 m. 1 w. 3 d. old, bred by Exhibitor.
329. Second Prize, £10, to Her Majesty the Queen, "Duchess de Brontee," red, white face, 1 y. 11 m. 2 w. 1 d. old, bred by Her Majesty.
331. Third Prize, £5, to William Tudge, of Adforton, Leintwardine, "Diadem," red, white face, 1 y. 11 m. old, by Exhibitor.
334. Reserve and Highly Commended, John Hungerford Arkwright, of Hampton Court, red, white face, 1 y. 11 m. 3 w. 4 d. old, bred by Exhibitor.
330. Commended, Thomas Rogers, of Coxall, Brampton Bryan, Herefordshire, "Queen of the Valley," red, white face, 1 y. 11 m. 2 w. 3 d. old, bred by Exhibitor.

CLASS 35.—*Heifer-Calf, above six and under twelve months old.*

336. First Prize, £10, to William Tudge, of Adforton, Leintwardine, "Silver Star," red, white face, 10 m. 3 w. old, bred by Exhibitor.
338. Second Prize, £5, to John Williams, St. Mary's, Kingsland, Leominster, Herefordshire, "Flower Girl," red, white face, 11 m. 3 w. old, bred by Exhibitor.

DEVONS.

CLASS 36.—*Bull, above three years old.*

347. First Prize, £25, to George Turner, of Bampford Speke, Exeter, Devonshire, "Albert Victor," red, 3 y. 6 m. 1 w. 3 d. old, bred by Exhibitor.
343. Second Prize, £15, to Viscount Falmouth, of Tregothnan, "Sunflower," 5 y. 4 m. 3 w. 5 d. old, bred by Exhibitor.
341. Third Prize, £5, Thomas Davy, Flitton Barton, North Molton, South Molton, Devonshire, "Duke of Flitton the 3rd," red, 3 y. 8 m. 1 w. old, bred by Exhibitor.
344. Reserve and Highly Commended, John Bodley, of Stockley Pomeroy, Crediton, Devonshire, "Lincoln," red, 4 y. 6 m. 1 w. old, bred by Exhibitor.
345. Commended, Walter Farthing, of Stowey Court, Bridgewater, Somersetshire, "Master Ellic," red, 4 y. 1 m. 3 w. 6 d. old, bred by Sir A. A. Hood, Bart., M.P., St. Audries, Bridgewater.
348. Commended, James Howard Buller, of Downes, Crediton, Devonshire, red, 3 y. 8 m. 3 w. 3 d. old, bred by the late Mr. Buller, M.P.

CLASS 37.—*Bull, above two and not exceeding three years old.*

350. First Prize, £25, to Walter Farthing, of Stowey Court, Bridgewater, Somersetshire, "St. Audries," red, 2 y. 6 m. 2 w. 4 d. old, bred by Sir A. A. Hood, Bart., M.P., St. Audries, Bridgewater.

Second Prize, £15, No Competitor.
Third Prize, £5, No Competitor.

CLASS 38.—*Yearling-Bull, above one and not exceeding two years old.*

356. First Prize, £25, to John A. Smith, of Bradford Peverell, Dorchester, Dorsetshire, "Triumph," red, 1 y. 2 m. 4 w. old, bred by Exhibitor.
354. Second Prize, £15, to Walter Farthing, of Stowey Court, Bridgewater, Somersetshire, "Master Arthur," red, 1 y. 2 m. 6 d. old, bred by Sir A. A. Hood, Bart., M.P., St. Audries, Bridgewater.
352. Third Prize, £5, to James Howard Buller, of Downes, Crediton, Devonshire, red, 1 y. 9 m. 4 w. 2 d. old, bred by Exhibitor.
357. Reserve and Highly Commended, William Smith, of Higher Hoopern, Exeter, Devonshire, brown, 1 y. 2 m. 4 w. old, bred by Exhibitor.
353. Commended, Abraham Umbers, of Weston Hall, Leamington Spa, Warwickshire, "Captain," red, 1 y. 3 m. 3 d. old, bred by Exhibitor.

CLASS 39.—*Bull-Calf, above six and not exceeding twelve months old.*

360. First Prize, £10, to Walter Farthing, of Stowey Court, Bridgewater, Somersetshire, "Napier," red, 8 m. 1 w. 3 d. old, bred by Exhibitor.
361. Second Prize, £5, George Turner, of Brampford Speke, Exeter, Devonshire, "Earl of Leicester," red, 6 m. 3 w. 2 d. old, bred by Exhibitor.
362. Reserve, John A. Smith, of Bradford Peverell, Dorchester, Dorsetshire, "Blink Bonny," red, 8 m. 2 w. 6 d. old, bred by Exhibitor.

CLASS 40.—*Cow, above three years old.*

369. First Prize, £20, to John A. Smith, of Bradford Peverell, Dorchester, Dorsetshire, "Daisy," red, in milk, 4 y. 6 m. 1 w. old, bred by Exhibitor.
368. Second Prize, £10, to William Smith, of Higher Hoopern, brown, in calf, 5 y. 5 m. 3 w. 1 d. old, bred by Exhibitor.
365. Third Prize, £5, to Walter Farthing, of Stowey Court, Bridgewater, Somersetshire, "Lady," red, in milk, 5 y. 6 m. 3 w. 3 d. old, bred by Sir A. A. Hood, Bart., M.P., St. Audries, Bridgewater.
363. Reserve and Highly Commended, Her Majesty the Queen, Windsor Castle, "Rose of Denmark," red, in milk, 5 y. 11 m. old, bred by Her Majesty.
370. Highly Commended, John A. Smith, of Bradford Peverell, Dorchester, Dorsetshire, "Curly," red, in milk, 6 y. 6m. 2w. 2d. old, bred by Exhibitor.

CLASS 41.—*Heifer, in milk or in calf, not exceeding three years old.*

373. First Prize, £15, to James Howard Buller, of Downes, Crediton, Devonshire, red, in calf, 2 y. 8 m. 3d. old, bred by Exhibitor.
377. Second Prize, £10, to Charles Hambro, of Milton Abbey, Blandford, Dorsetshire, "Mary," red, in calf, 2 y. 11 m. 4 w. old, bred by Exhibitor.
374. Third Prize, £5, to Walter Farthing, of Stowey Court, Bridgewater, Somersetshire, "Miss Bessie," red, in calf, 2 y. 5 m. 4 w. 1 d. old, bred by Exhibitor.
376. Reserve and Highly Commended, George Turner, of Brampford Speke, "Lady Mary," red, in calf, 2 y. 5 m. 3 w. 6 d. old, bred by Exhibitor.

372. Highly Commended, Her Majesty the Queen, Windsor Castle, "Princess Helena," red, in calf, 2 y. 10 m. 2 w. old, bred by Her Majesty.
375. Commended, George Turner, of Brampford Speke, Exeter, Devonshire, "Verbena," red, in calf, 2 y. 2 m. 3 w. 3 d. old, bred by Exhibitor.

CLASS 42.—*Yearling Heifer, above one and not exceeding two years old.*

384. First Prize, £15, to William Smith, of Higher Hoopern, Exeter, Devonshire, brown, 1 y. 8 m. 2 w. old, bred by Exhibitor.
383. Second Prize, £10, to John A. Smith, of Bradford Peverell, Dorchester, Dorsetshire, "Fancy," red, 1 y. 8 m. 2 w. 5 d. old, bred by Exhibitor.
381. Third Prize, £5, to Walter Farthing, of Stowey Court, Bridgewater, Somersetshire, "Miss Laura," red, 1 y. 6 m. 3 w. 6 d. old, bred by Exhibitor.
382. Reserve, Charles Hambro, of Milton Abbey, Blandford, Dorsetshire, "Princess," red, 1 y. 10 m. 2 w. 5 d. old, bred by Exhibitor.

CLASS 43.—*Heifer-Calf, above six and under twelve months old.*

386. First Prize, £10, to Her Majesty the Queen, Windsor Castle, "Rosa," red, 11 m. old, bred by Her Majesty.
390. Second Prize, £5, to John A. Smith, of Bradford Peverell, Dorchester, Dorsetshire, "Picture," red, 9 m. 1 w. 1 d. old, bred by Exhibitor.
387. Reserve and Highly Commended, James Howard Buller, of Downes, Crediton, Devonshire, red, 7 m. 5 d. old, bred by Exhibitor.
389. Commended, George Turner, of Brampford Speke, Exeter, Devonshire, "Lady Agnes," red, 6 m. 1 w. 4 d. old, bred by Exhibitor.

SUSSEX.

CLASS 44.—*Bull, above one year old.*

391. First Prize, £15, to William Marshall, of Bolney Place, Cuckfield, Sussex, "Napier," red, 1 y. 4 m. 2 w. 2 d. old. Bred by Exhibitor.

CLASS 45.—*Cow, above three years old.*

392. First Prize, £15, to John and Alfred Heasman, of Angmering, Arundel, Sussex, "Ada," red, in milk, 8 y. 5 m. 3 w. 4 d. old, bred by Exhibitor. Second Prize withheld.

CLASS 46.—*Heifer, in milk or in calf, not exceeding three years old.*

394. First Prize, £15, to John and Alfred Heasman, of Angmering, Arundel, Sussex, "Leicester," red, in calf, 1 y. 9 m. 1 w. 5 d. old, bred by Exhibitor.
395. Second Prize, £10, to William Marshall, of Bolney Place, Cuckfield, Sussex, "Caroline," red, in calf, 2 y. 10 m. 4 d. old, bred by Exhibitor.

CHANNEL ISLANDS.

CLASS 47.—*Bull, above one year old.*

398. First Prize, £15, to Clement Pallott, of St. Saviour's, "Sultan," light brown, 2 y. 3 m. 4 d. old (Jersey), bred by C. Lesbirel, Trinity Jersey.
399. Second Prize, £10, to Philip Gaudin, of Spring Farm, St. Martin's, St. Helier's, Jersey, "Clement," light red, 1 y. 11 m. 3 w. 2 d. old (Jersey), bred by Mr. E. Gibaut, St. Lawrence, St. Helier's, Jersey.

397. Reserve and Commended, Clement Pallot, of St. Saviour's, Jersey, "Black-tail," grey, 1 y. 2 m. old (Jersey), bred by J. Horman, St. Peter's, Jersey.

CLASS 48.—*Cow, above three years old.*

411. First Prize, £15, to Philip Gaudin, of Spring Farm, "Lady Bird," grey, in milk, 4 y. 10 m. 1 w. old (Jersey), bred by Exhibitor.
413. Second Prize, £10, to Philip Gaudin, of Spring Farm, "Lady Best," light brown, in milk, 7 y. 2 m. old (Jersey), bred by Exhibitor.
412. Reserve and Highly Commended, Philip Gaudin, of Spring Farm, "Brunette," dark brown, in milk, 6 y. 2 m. old (Jersey), bred by Exhibitor.
402. Highly Commended, Lady Berners, of Keythorpe Hall, Leicestershire, "Fawn," smutty-fawn, in calf, 9 y. 3 m. old (Guernsey), bred by D. Goodland, Havilland, St. Peter's, Guernsey.
409. Commended, Clement Pallot, St. Saviour's, Jersey, "Countess," grey and white, in calf, 3 y. old, bred by G. Fleury, St. Peter's, Jersey.

CLASS 49.—*Heifer, in milk or in calf, not exceeding three years old.*

425. First Prize, £15, to Clement Pallot, of St. Saviour's, "Shorthorn," pale red and white, in calf, 2 y. 3 m. 3w. 6 d. old (Jersey), bred by Exhibitor.
421. Second Prize, £10, to Philip Gaudin, of Spring Farm, St. Martin's, St. Helier's, Jersey, "Camelia," red and white, in calf, 2 y. 4 w. 1 d. old (Jersey), bred by Exhibitor.
442. Reserve, Sir Willoughby Jones, Bart., of Cranmer Hall, Fakenham, Norfolk, "Moss Rose," red, in milk, 3 y. 4 w. old (Norfolk Polled), bred by Exhibitor.

OTHER ESTABLISHED BREEDS.

(*Not including the Short-horn, Hereford, Devon, Sussex, or Channel Island Breeds.*)

CLASS 50.—*Bull, above one year old.*

435. First Prize, £15, to the Duke of Buckingham and Chandos, of Stowe Park, Buckingham, "Conqueror," red brindled, 4 y. 2 m. 1 w. old (Longhorn), bred by Mr. Godfrey, Wigston Parva, Hinckley, Leicestershire.
438. Second Prize, £10, to Joseph Holland Burbery, of the Chase, Kenilworth, Warwickshire, coloured and white, 3 y. 3 m. old (Longhorn), bred by Mr. Twycross, Canley, Coventry.
439. Reserve and Highly Commended, Lord Sondes, of Elmham Hall, Thetford, Norfolk, "Cupid," red, 3 y. 6 m. old (Norfolk Polled), bred by Mr. T. Brown, Marham Hall Farm, Downham, Norfolk.
436. Commended, John Borlase Tibbits, of Barton Seagrave, Kettering, Northamptonshire, "Eclipse 2nd," blood red, 4 y. 7 m. 3 d. old (Norfolk Polled), bred by Mr. S. Wolton, Newbourne Hall, Woodbridge, Suffolk.
437. Commended, Richard Hemming Chapman, of Upton, Nuneaton, "Earl of Derby," brindled and white, 6 y. 3 m. 3 w. 3 d. old (Longhorn), bred by Exhibitor.

CLASS 51.—*Cow, above three years old.*

443. First Prize, £15, Richard Hemming Chapman, of Upton, Nuneaton, "Brindled Beauty," brindled and white, in milk, 5 y. 3 m. 2 w. old (Pure Longhorn), bred by Exhibitor.

450. Second Prize, £10, to John Godfrey, of Wigston Parva, "Red Rose," red and white, in milk and in calf, 9 y. 2 m. 3 w. old (Longhorn).
445. Reserve and Highly Commended, Sir John Harper Crewe, Bart., of Calke Abbey, "Lofty," red, in milk and in calf, about 7 y. old (Longhorn), bred by the late Hon. R. Curzon, Hagley Hall, Staffordshire.
444. Highly Commended, Sir John Harper Crewe, Bart., of Calke Abbey, Derby, "Tulip 2nd," brindled and white, in calf, 6 y. 9 m. 2 w. 1 d. old (Longhorn), bred by Exhibitor.
452. Commended, Francis Beresford Wright, of Aldercar Hall, Langley Mill, Derbyshire, "Magpie," black and white, in milk and in calf, age and breeder unknown (Brittany).
453. Commended, Francis Beresford Wright, of Aldercar Hall, Langley Mill, Derbyshire, "Nightshade," black, white spot, in calf, age and breeder unknown (Brittany).

CLASS 52.—*Heifer, in milk or in calf, not exceeding three years old.*

455. First Prize, £15, to Richard Hemming Chapman, of Upton, Nuneaton, "Rose of Dishley," coloured and white, in calf, 1 y. 1 m. 3 w. 3 d. old (Longhorn), bred by Exhibitor.
456. Second Prize, £10, to Lord Sondes, of Elmham Hall, Thetford, Norfolk, "Cherry 4th," red, in calf, 2 y. old (Norfolk Polled), bred by Exhibitor.
457. Reserve and Commended, Lord Sondes, of Elmham Hall, "Kate," red, in calf, 2 y. 5 m. old (Norfolk Polled), bred by Mr. W. Bradfield, Ramsley Farm, Elmham.

SHEEP.

LEICESTER.

CLASS 53.—*Shearling Ram.*

465. First Prize, £20, to Lieut.-Col. William Inge, of Thorpe Constantine, 1 y. 4 m. old, bred by Exhibitor.
459. Second Prize, £10, to George Henry Sanday, of Holme Pierrepont, Nottinghamshire, 1 y. 4 m. old, bred by Exhibitor.
496. Third Prize, £5, to John Borton, of Barton House, 1 y. 3 m. old, bred by Exhibitor.
468. Reserve and Highly Commended, George Turner, jun., Alexton Hall, Uppingham, 1 y. 3 m. 2 w. old, bred by Exhibitor.
463. Commended, Lieut.-Col. Inge, of Thorpe Constantine, Tamworth, Staffordshire, 1 y. 4 m. old, bred by Exhibitor.
469. Commended, George Turner, jun., Alexton Hall, Uppingham, 1 y. 3 m. 2 w. old, bred by Exhibitor.
470. Commended, George Turner, jun., of Alexton Hall, 1 y. 3 m. 2 w. old, bred by Exhibitor.
487. Commended, Robert Ward Creswell, of Ravenstone, 1 y. 4 m. old, bred by Exhibitor.
489. Commended, Robert Ward Creswell, of Ravenstone, 1 y. 4 m. old, bred by Exhibitor.
490. Commended, George Turner, of Bampford Speke, Exeter, Devonshire, 1 y. 3 m. 2 w. old, bred by Exhibitor.
495. Commended, John Borton, of Barton House, 1 y. 3 m. old, bred by Exhibitor.
501. Commended, Thomas Stamper, of Highfield House, Oswaldkirk, Yorkshire, "S. W.," 1 y. 3 m. 1 w. old, bred by Exhibitor.
502. Commended, Thomas Stamper, of Highfield House, "A. A.," 1 y. 3 m. 1 w. old, bred by Exhibitor.

CLASS 54.—*Ram of any other age.*

510. First Prize, £20, to George Turner, jun., of Alexton Hall, Uppingham, Leicestershire, 2 y. 3 m. 2 w. old, bred by Exhibitor.
532. Second Prize, £10, to John Borton, of Barton House, 3 y. 3 m. old, bred by Exhibitor.
507. Third Prize, £5, to George Henry Sanday, of Holme Pierrepont, 3 y. 4 m. old, bred by Exhibitor.
533. Reserved and Highly Commended, John Borton, of Barton House, 3 y. 3 m. old, bred by Exhibitor.
517. Highly Commended, Edmond Riley, of Kipling Cotes Farm, Beverley, Yorkshire, 3 y. 3 m. 2 w. old, bred by Exhibitor.
504. Commended, Thomas Allen, Thurmaston, Leicester, 4 y. 4 m. old, bred by Exhibitor.
516. Commended, Thomas Marris, of the Chase, three years old, bred by Lieut.-Col. Inge, of Thorpe, Tamworth, Leicestershire.
527. Commended, George Turner, of Bamford Speke, 2 y. 3 m. 2 w. old, bred by Exhibitor.

CLASS 55.—*Pen of Five Shearling Ewes, of the same flock.*

538. First Prize, £15, to Lieut.-Colonel William Inge, of Thorpe Constantine, Tamworth, Staffordshire, 1 y. 4 m. old, bred by Exhibitor.
548. Second Prize, £10, to John Borton, of Barton House, Barton-le-street, Malton, Yorkshire, 1 y. 3 m. old, bred by Exhibitor.
539. Third Prize, £5, to Lieut.-Colonel William Inge, of Thorpe Constantine, 1 y. 4 m. old, bred by Exhibitor.
535. Reserved and Highly Commended, William Brown, of High Gate, Holme on Spalding Moor, Yorkshire, 1 y. 3 m. old, bred by Exhibitor.
536. Highly Commended, Lord Berners, of Keythorpe Hall, Leicester, 1 y. 3 m. old, bred by Exhibitor.
537. Highly Commended, George Henry Sanday, of Holme Pierrepont, Nottinghamshire, 1 y. 4 m. old, bred by Exhibitor.
541. Commended, Thomas Marris, of the Chase, Ulceby, Lincolnshire, 1 y. 3 m. old, bred by Exhibitor.
542. Commended, Edmond Riley, of Kipling Cotes Farm, Beverley, Yorkshire, 1 y. 3 m. 2 w. old, bred by Exhibitor.

CLASS 56.—*Pen of Five Breeding Ewes which have suckled Lambs until the 1st of June*, 1868.

553. First Prize, £15, to Lieut.-Colonel Inge, of Thorpe Constantine, Tamworth, Staffordshire, various ages, bred by Exhibitor.
551. Second Prize, £10, to William Brown, of High Gate, Holme on Spalding Moor, Yorkshire, various ages, bred by Exhibitor.
552. Reserved and Highly Commended, Lord Berners, of Keythorpe Hall, Leicester, various ages, bred by Exhibitor.
555. Highly Commended, Edmond Riley, of Kipling Cotes Farm, Beverley, Yorkshire, 3 y. 3 m. 2 w. old, bred by Exhibitor.

COTSWOLD.

CLASS 57.—*Shearling Ram.*

576. First Prize, £20, to Thomas Brown, of Marham Hall Farm, 1 y. 4 m. 2 w. old, bred by Exhibitor.
570. Second Prize, £10, to John Gillett, of Oaklands, 1 y. 4 m. 2 w. old, bred by Exhibitor.

563. Third Prize, £5, to John Gillett, of Minster Lovell, 1 y. 3 m. 2 w. old, bred by Exhibitor.
577. Reserved and Highly Commended, Thomas Brown, of Marham Hall Farm, 1 y. 4 m. 2 w. old, bred by Exhibitor.
573. Commended, Thomas Brown, of Marham Hall Farm, 1 y. 4 m. 2 w. old, bred by Exhibitor.

CLASS 58.—*Ram of any other age.*

604. First Prize, £20, to John King Tombs, of Langford, 3 y. 4 m. old, bred by Mr. Lane, of Broadfield, Northleach, Gloucestershire.
591. Second Prize, £10, John Gillett, of Minster Lovell, Witney, Oxfordshire, 4 y. 3 m. old, bred by Exhibitor.
600. Third Prize, £5, Thomas Brown, of Marham Hall Farm, 3 y. 4 m. 2 w. old, bred by Exhibitor.
596. Reserved and Highly Commended, Thomas Brown, of Marham Hall Farm, Downham Market, Norfolk, 2 y. 4 m. 2 w. old, bred by Exhibitor.
597. Commended, Thomas Brown, of Marham Hall Farm, 2 y. 4 m. 2 w. old, bred by Exhibitor.

CLASS 59.—*Pen of Five Shearling Ewes, of the same flock.*

607. First Prize, £15, John Gillet, of Minster Lovell, Witney, Oxon., 1 y. 3 m. old, bred by Exhibitor.
609. Second Prize, £10, Thomas Brown, of Marham Hall Farm, Downham Market, Norfolk, 1 y. 4 m. 2 w. old, bred by Exhibitor.
612. Third Prize, £5, John King Tombs, of Langford, Lechlade, Gloucestershire, 1 y. 4 m. old, bred by Exhibitor.
610. Reserved and Highly Commended, Thomas Brown, of Marham Hall Farm, 1 y. 4 m. 2 w. old, bred by Exhibitor.
613. Highly Commended, John King Tombs, of Langford, 1 y. 4 m. old. bred by Exhibitor.

LINCOLN AND OTHER LONG-WOOLLED.

(*Not qualified to compete as Leicesters or Cotswolds.*)

CLASS 60.—*Shearling Ram.*

625. First Prize, £20, to Robert Wright, of Nocton Heath, Nocton, Lincolnshire, 1 y. 4 m. old, bred by Exhibitor.
629. Second Prize, £10, to Charles Williams, of Carlton le Moorland, 1 y. 3 m. 2 w. old, bred by Exhibitor.
617. Third Prize, £5, to William Francis Marshall, of Branston, Lincolnshire, 1 y. 4 m. 2 w. old, bred by Exhibitor.
626. Reserve and Highly Commended, Robert Wright, of Nocton Heath, 1 y. 4 m. old, bred by Exhibitor.
628. Commended, Charles Williams, of Carlton le Moorland, 1 y. 3 m. 2 w. old, bred by Exhibitor.

CLASS 61.—*Ram of any other age.*

636. First Prize, £20, to William Francis Marshall, of Branston, 4 y. 4 m. 2 w. old, bred by the late Mr. T. B. Marshall, of Branston.
634. Second Prize, £10, to William Francis Marshall, of Branston, Lincolnshire, 2 y. 4 m. 2 w. old, bred by the late Mr. T. B. Marshall, of Branston, Lincolnshire.
640. Reserve and Highly Commended, Messrs. Dudding, of Panton House, Wragby, Lincolnshire, "Young Champion," 2 y. 3 m. 3 w. old, bred by Exhibitor.

CLASS 62.—*Pen of Five Shearling Ewes, of the same flock.*

660. First Prize, £15, to Thomas Cartwright, of Dunston Pillar, 1 y. 4 m. old, bred by Exhibitor.
658. Second Prize, £10, to John Pears, of Mere, Lincolnshire, 1 y. 4 m. old, bred by Exhibitor.
656. Third Prize, £5, to Robert Wright, of Nocton Heath, 1 y. 4 m. old, bred by Exhibitor.
659. Reserve and Highly Commended, Thomas Cartwright, of Dunston Pillar, Dunston, Lincolnshire, 1 y. 4 m. old, bred by Exhibitor.

The Class generally commended.

OXFORDSHIRE DOWNS.

CLASS 63.—*Shearling Ram.*

664. First Prize, £20, to George Wallis, of Old Shifford, 1 y. 5 m. 2 w. old, bred by Exhibitor.
667. Second Prize, £10, to George Wallis, of Old Shifford, 1 y. 5 m. 2 w. old, bred by Exhibitor.
683. Third Prize, £5, to Joseph Roberts, of Caswell Farm, 1 y. 4 m. old, bred by Exhibitor.
665. Reserve and Highly Commended, George Wallis, of Old Shifford, 1 y. 5 m. 2 w. old, bred by Exhibitor.
677. Commended, John Bryan, of Southleigh, 1 y. 4 m. old, bred by Exhibitor.
678. Commended, John Bryan, of Southleigh, 1 y. 4 m. old, bred by Exhibitor.

CLASS 64.—*Ram of any other age.*

685. First Prize, £20, to George Wallis, of Old Shifford, 3 y. 5 m. 2 w. old, bred by Exhibitor.
686. Second Prize, £10, to John Treadwell, of Upper Winchendon, Aylesbury, Buckinghamshire, "Crackwell," about 6 y. 4 m. 2 w. old, bred by the Executors of the late Samuel Treadwell.
687. Reserve, Charles Howard, of Biddenham, Bedfordshire, 2 y. 4 m. 2 w. old, bred by Exhibitor.

CLASS 65.—*Pen of Five Shearling Ewes, of the same flock.*

690. First Prize, £15, to George Wallis, of Old Shifford, Bampton, Faringdon, 1 y. 5 m. 2 w. old, bred by Exhibitor.
693. Second Prize, £10, to Henry Overman, of Weasenham Brandon, Norfolk, 1 y. 4 m. 2 w. old, bred by Exhibitor.
696. Third Prize, £5, to Sir Henry William Dashwood, Bart., of Kirtlington Park, Oxfordshire, 1 y. 4 m. old, bred by Exhibitor.
695. Reserve, Charles Howard, of Biddenham, 1 y. 4 m. 2 w. old, bred by Exhibitor.

SOUTH DOWN.

CLASS 66.—*Shearling Ram.*

697. First Prize, £20, to William Rigden, of Hove, Brighton, Sussex, 1 y. 4 m. old, bred by Exhibitor.
708. Second Prize, £10, to Lord Walsingham, of Merton Hall, 1 y. 4 m. old, bred by Exhibitor.
711. Third Prize, £5, to Lord Walsingham, of Merton Hall, 1 y. 4 m. old, bred by Exhibitor.

707. Reserve and Highly Commended, Lord Walsingham, of Merton Hall, 1 y. 4 m. old, bred by Exhibitor.
699. Highly Commended, William Rigden, of Hove, 1 y, 4 m. old, bred by Exhibitor.
705. Highly Commended, the Duke of Richmond, K.G., of Goodwood, 1 y. 4 m. old, bred by Exhibitor.
704. Commended, the Duke of Richmond, K.G., of Goodwood, 1 y. 4 m. old, bred by Exhibitor.
712. Commended, Lord Walsingham, of Merton Hall, 1 y. 4 m. old, bred by Exhibitor.

CLASS 67.—*Ram of any other age.*

725. First Prize, £20, to William Rigden, of Hove, Brighton, Sussex, 2 y. 4 m. old, bred by Exhibitor.
735. Second Prize, to Lord Walsingham, of Merton Hall, 3 y. 4 m. old, bred by Exhibitor.
738. Third Prize, £5, to Sir William Throckmorton, Bart., of Buckland, Faringdon, Berkshire, 2 y. 4 m. old, bred by Exhibitor.
734. Reserve and Highly Commended, Lord Walsingham, of Merton Hall, 3 y. 4 m. old, bred by Exhibitor.
729. Commended, the Duke of Richmond, K.G., of Goodwood, 2 y. 4 m. old, bred by Exhibitor.
741. Commended, Henry Humphrey, of Ashington, "No. 11," 3 y. 3 m. 2 w. old, bred by Exhibitor.

CLASS 68.—*Pen of Five Shearling Ewes, of the same flock.*

748. First Prize, £15, Lord Walsingham, of Merton Hall, Thetford, Norfolk, 1 y. 4 m. old, bred by Exhibitor.
753. Second Prize, £10, the Earl of Radnor, of Coleshill, Highworth, Wilts, 1 y. 4 m. old, bred by Exhibitor.
745. Third Prize, £5, to the Duke of Richmond, K.G., of Goodwood, Chichester, Sussex, 1 y. 4 m. old, bred by Exhibitor.
750. Reserve and Highly Commended, Sir William Throckmorton, Bart., of Buckland, Faringdon, Berks, 1 y. 4 m. old, bred by Exhibitor.
747. Commended, John and Alfred Heasman, of Angmering, Arundel, Sussex, 1 y. 4 m. old, bred by Exhibitor.

SHROPSHIRE.

CLASS 69.—*Shearling Ram.*

802. First Prize, £20, to James and Edward Crane, of Shrawardine, 1 y. 3 m. 2 w. old, bred by Exhibitors.
809. Second Prize, £10, to Thomas Mansell, of Adcott Hall, 1 y. 4 m. 2 w. old, bred by Exhibitor.
806. Third Prize, £5, to Thomas Mansell, of Adcott Hall, 1 y. 4 m. old, bred by Exhibitor.
780. Reserve and Highly Commended, George Griffiths, of Old Hall, Hanmer, Whitchurch, Shropshire, "Pride of Hanmer," bred by Exhibitor.
781. Commended, George Griffiths, of Old Hall, "Duke of Flint," 1 y. 3 m. 3 w. old, bred by Exhibitor.
785. Commended, Henry Smith, of Sutton Maddock, Shiffnall, Shropshire, 1 y. 4 m. old, bred by Exhibitor.
786. Commended, Henry Smith, of Sutton Maddock, 1 y. 4 m. old, bred by Exhibitor.
805. Commended, Thomas Mansell, of Adcott Hall, 1 y. 4 m. old, bred by Exhibitor.

CLASS 70.—*Ram of any other age.*

835. First Prize, £20, to John Evans, of Uffington, Shrewsbury, Salop, "Uffington," 2 y. 3 m. old, bred by Exhibitor.
836. Second Prize, £10, to James and Edward Crane, of Shrawardine, Shrewsbury, Salop, "Crosswood Hero," 2 y. 3 m. old, bred by Exhibitors.
827. Third Prize, Charles Byrd, of Lyttywood, Staffordshire, "Viceroy," 3 y. 4 m. 2 w. old, bred by Mr. Charles Reynolds Keeling, of Yew Tree Farm, Penkridge, Staffordshire.
839. Reserve and Highly Commended, Edward Holland, M.P., of Dumbleton Hall, Evesham, "Royal Ranger," 2 y. 4 m. 1 w. old, bred by Exhibitor.
830. Highly Commended, Lord Penrhyn, of Penrhyn Castle, Bangor, Carnarvonshire, 2 y. 3 m. 2 w. old, bred by Exhibitor.
831. Highly Commended, Thomas Jones, of Kiln Green, Malpas, Cheshire, "Pride of Agden," 2 y. 2 m. 2 w. old, bred by Exhibitor.
819. Commended, Mrs. Anne Owen Baker, of Grendon, Atherstone, Warwickshire, 2 y. 3 m. 3 w. old, bred by Exhibitor.
822. Commended, Thomas Horton, of Harnage Grange, Shrewsbury, Salop, "Friendship," 2 y. 3 m. old, bred by Exhibitor.

CLASS 71.—*Pen of Five Shearling Ewes, of the same flock.*

853. First Prize, £15, John Evans, of Uffington, Shrewsbury, Salop, 1 y. 3 m. old, bred by Exhibitor.
841. Second Prize, £10, Lord Chesham, of Latimer, Chesham, Buckinghamshire, 1 y. 2 m. 3 w. old, bred by Exhibitor.
856. Third Prize, £5, John Coxon, of Freeford Farm, Lichfield, Staffordshire, 1 y. 3 m. 2 w. old, bred by Exhibitor.
850. Reserve and Highly Commended, Joseph Beach, of the Hattons, Brewood, Staffordshire, 1 y. 4 m. old, bred by Exhibitor.
854. Highly Commended, James and Edward Crane, of Shrawardine, Shrewsbury, Salop, 1 y. 3 m. old, bred by Exhibitors.
842. Commended, Lord Chesham, of Latimer, 1 y. 3 m. 2 w. old, bred by Exhibitor.
844. Commended, Thomas Horton, of Harnage Grange, 1 y. 3 m. 1 w. old, bred by Exhibitor.
846. Commended, Lord Wenlock, of Escrick Park, Yorkshire, 1 y. 3 m. 2 w. old, bred by Exhibitor.
852. Commended, Henry Smith, of Sutton Maddock, Shiffnal, bred by Exhibitor.

HAMPSHIRE AND OTHER SHORT-WOOLLED.

CLASS 72.—*Shearling Ram.*

867. First Prize, £20, to Robert and John Russell, of Horton Kirby, Dartford, Kent, 1 y. 5 m. old, bred by Exhibitors.
861. Second Prize, £10, to Stephen King, of Bockhampton Farm, Lambourn, Berkshire, 1 y. 4 m. 2 w. old (West Country), bred by Exhibitor.
862. Third Prize, £5, to Robert Coles, of Middleton, Norton Bavant, Warminster, Wiltshire, "Young Victor," 1 y. 4 m. old, bred by Exhibitor.
864. Reserve and Highly Commended, James Rawlence, of Bulbridge, Wilton, Salisbury, Wilts, 1 y. 5 m. old, bred by Exhibitor.

860. Highly Commended, Stephen King, of Bockhampton Farm, Lambourn, Berkshire, 1 y. 4 m. 2 w. old (West Country), bred by Exhibitor.

CLASS 73.—*Ram of any other age.*

870. First Prize, £20, James Rawlence, of Bulbridge, Wilton, Salisbury, Wilts, 3 y. 4 m. old (West Country), bred by Exhibitor.
871. Second Prize, £10, to James Rawlence, of Bulbridge, 3 y. 5 m. old (West Country), bred by Exhibitor.
869. Third Prize, £5, to Robert Coles, of Middleton, Norton Bavent, Warminster, Wilts, "King Victor," 2 y. 4 m. old, bred by Exhibitor.

CLASS 74.—*Pen of Five Shearling Ewes, of the same flock.*

875. First Prize, £15, James Rawlence, of Bulbridge, 1 y. 5 m. old (West Country), bred by Exhibitor.
874. Second Prize, £10, James Rawlence, of Bulbridge, Wilton, Salisbury, Wilts, 4 y. 5 m. old (West Country), bred by Exhibitor.
873. Reserve, James Rustell, of Patham Court, Eynsford, Kent, 1 y. 5 m. 2 w. old, bred by Exhibitor.

PIGS.

CLASS 75.—*Boar of a large white breed.*

880. First Prize, £10, to Richard Elmhirst Duckering, of Northorpe, "Victor 2nd," 2 y. 9 m. 1 d. old, bred by Exhibitor.
876. Second Prize, £5, James and Frederick Howard, of Britannia Farms, Bedfordshire, "Victor," 1 y. 10 m. old, bred by Mr. Duckering, of Kirton Lindsey, Lincolnshire.
877. Reserve, William Eardley, of Larkton Hall, Malpas, Cheshire, "Cheshire Lad," 3 y. 1 m. 1 w. 3 d. old, bred by Exhibitor.

CLASS 76.—*Boar of a small white breed.*

889. First Prize, £10, Peter Eden, of Cross Lane, Salford, Manchester, Lancashire, "Lord Nelson," 2 y. 6 m. old, bred by Mr. Thomas Crisp, of Butley Abbey, Wickham Market, Suffolk.
899. Second Prize, £5, William Hatton, of Addingham, Leeds, Yorkshire, 1 y. 10 m. old, breeder unknown.
894. Reserve, Thomas Atherton, of Chapel House, Speke, Liverpool, Lancashire, 1 y. 9 m. old, bred by Exhibitor.

CLASS 77.—*Boars of a small black breed.*

902. First Prize, £10, to George Turner, jun., of Allexton Hall, Uppingham, 1 y. 8 m. 2 w. old (improved Essex), bred by Exhibitor.
905. Second Prize, £5, Rev. William Holt Beever, of Pencraig Court, Ross, Herefordshire, "Black Prince 4th," 1 y. 10 m. old (Black Suffolk), bred by Exhibitor.
903. Reserve, William Hemming, of Coldicott, Moreton-in-the-Marsh, Gloucestershire, "Master M'Thomas," 1 y. 2 m. 2 w. 2 d. old (Suffolk and Essex), bred by Exhibitor.

CLASS 78.—*Boar of the Berkshire breed.*

908. First Prize, £10, to Joseph Smith, of Henley-in-Arden, Warwickshire, "Young Punch," black, with little white, 1 y. 2 w. 2 d. old, bred by Exhibitor.
912. Second Prize, £5, Russell Swanwick, of the Royal Agricultural College Farm, Cirencester, Gloucestershire, "Othello," black and white, 10 m. 1 d. old, bred by Captain Stewart, Saint Bridge House, Gloucester.

915. Reserve, Heber Humfrey, of Kingitone Farm, Shrivenham, Berkshire, "271 M," black, with little white, 6 m. 3 w. 6 d. old, bred by Exhibitor.

CLASS 79.—*Boar of a breed not eligible for the preceding classes.*

923. First Prize, £10, Robert Elmhirst Duckering, of Northorpe, Kirton-Lindsey, Lincolnshire, "Comet," white, 2 y. 7 m. old (Middle), bred by Exhibitor.
292. Second Prize, £5, to Peter Eden, of Cross Lane, Salford, Manchester, "King Lear 2nd," white, 2 y. 1 m. 2 w. 4 d. old (Middle), bred by Exhibitor.
925. Reserve, William Hatton, of Addingham, Leeds, Yorkshire, "King of the West," white, 4 y. 2 m. 1 w. 2 d. old (Middle), bred by Colonel Townley, Burnley, Lancashire.

CLASS 80.—*Breeding Sow of a large white breed.*

929. First Prize, £10, to Peter Eden, of Cross Lane, Salford, Manchester, "Lucy," 2 y. 3 m. old, bred by Mr. R. Dickin, Lancashire Hill, Stockport, Lancashire.
931. Second Prize, £5, Richard Elmhirst Duckering, of Northorpe, Kirton Lindsey, Lincolnshire, "Countess of Leicester," 2 y. 3 w. old, bred by Exhibitor.
927. Reserve, James and Frederick Howard, Britannia Farms, Bedford, "Miss Kate," in pig, 1 y. 4 w. old, bred by Exhibitor.

CLASS 81.—*Breeding Sow of a small white breed.*

949. First Prize, £10, William Hatton, of Addingham, 1 y. 10 m. old, bred by Mr. Thomas Foster, of Bingley.
939. Second Prize, £5, Peter Eden, of Cross Lane, Salford, Manchester, Lancashire, "Violet," 1 y. 10 m. 1 w. 1 d. old, bred by Exhibitor.
941. Reserve and Highly Commended, Thomas Atherton, of Chapel House, Speke, Liverpool, Lancashire, 2 y. 8 m. old, bred by Mr. Peter Eden, of Salford, Manchester.
944. Highly Commended, Richard Elmhurst Duckering, of Northope, Kirton-Lindsey, Lincolnshire, "Lilly," in pig, 11 m. 3 w. 6d. old, bred by Exhibitor.

CLASS 82. *Breeding Sow of a small black breed.*

955. First Prize, £10, to Thomas Crisp, of Butley Abbey, in pig, 2 y. 1 m. 1 d. old, bred by Exhibitor.
951. Second Prize, £5, to Thomas Atherton, of Chapel House, Speke, Liverpool, Lancashire, "Formosa," in pig, 1 y. 3 d. old (Black Suffolk), bred by Mr. G. M. Sexton, of Wherstead Hall, Ipswich, Suffolk.

CLASS 83.—*Breeding Sow of the Berkshire breed.*

960. First Prize, £10, to Sir William Throckmorton, Bart., of Buckland, Farringdon, Berkshire, "Queen," black, with little white, 2 y. old, bred by Exhibitor.
968. Second Prize, £5, Thomas Crisp, of Butley Abbey, black and white, in pig, 2 y. 8 m. 1 w. old, bred by Exhibitor.
958. Reserve and Highly Commended, Arthur Steward, of Saint Bridge House, "Young Sukey," black, with little white, in pig, 1 y. 3 w. 5 d. old, bred by Exhibitor.
962. Highly Commended, Russell Swanwick, of the Royal Agricultural College Farm, Cirencester, Gloucestershire, "Young Sally," black and white, 1 y. 10 m. 3 w. old, by Exhibitor.

CLASS 84.—*Breeding Sow of a breed not eligible for the preceding classes.*

971. First Prize, £10, to Peter Eden, of Cross Lane, Salford, Manchester, "Queen of Trumps," white, about 3 y. old (middle), bred by Mr. Thomas Foster, of Crow-nest, Bingley, Yorkshire.
975. Second Prize, £5, to William Hatton, of Addingham, Leeds, Yorkshire, white, in pig, 2 years old (middle), bred by Exhibitor.
977. Reserve, William Hatton, of Addingham, Leeds, Yorkshire, white, in pig, 2 years old (middle), bred by Exhibitor.

CLASS 85.—*Pen of Three Breeding Sow Pigs of a large white breed, of the same litter, above* 4 *and under* 8 *months old.*

979. First Prize, £10, Matthew Walker, of Stockley Park, "Tulip," "Snowdrop," and "Crocus," 7 m. 3 w. 2 d. old, bred by Exhibitor.
982. Second Prize, £5, Richard Elmhirst Duckering, of Northope, "Rose," "Shamrock," "Thistle," 7 m. 3 w. 6 d. old, bred by Exhibitor.
980. Reserve, George Chapman, of Seamere, Yorkshire, 7 m. 1 w. 6 d. old, bred by Exhibitor.

CLASS 86.—*Pen of Three Breeding Sow Pigs of a small white breed, of the same litter, above* 4 *and under* 8 *months old.*

987. First Prize, £10, Earl of Radnor, of Coleshill, Highworth, Wiltshire, 8 m. old (Coleshill), bred by Exhibitor.
985. Second Prize, £5, to Aylmer, of West Dereham Abbey, Stoke Ferry, Norfolk, 7 m. 2 w. old, bred by Exhibitor.
984. Reserve, Lord Wenlock, of Escrick, Yorkshire, 6 m. 1 w. 3 d. old, bred by Exhibitor.

CLASS 87.—*Pen of Three Breeding Sow Pigs of a small black breed, of the same litter, above* 4 *and under* 3 *months old.*

No Entry.

CLASS 88.—*Pen of Three Breeding Sow Pigs of the Berkshire breed, of the same litter, above* 4 *and under* 8 *monlhs old.*

988. First Prize, £10, Joseph Smith, Henley-in-Arden, Warwickshire, black and white, 7 m. 3 w. 5 d. old, bred by Exhibitor.
992. Second Prize, £5, Heber Humfrey, of Kingstone Farm, "271 A, B, and C," black, with little white, 6 m. 3 w. 1 d. old, bred by Exhibitor.
991. Reserve and Highly Commended, Heber Humfrey, of Kingstone Farm, Shrivenham, Berkshire, "271 D, E, and F," black, with little white, 6 m. 3 w. 6 d. old, bred by Exhibitor.
989. Highly Commended, William Yells, of Round Robin Farm, Highworth, Wiltshire, "Athena," "Formosa," "Green Sleeve," black and white, 6 m. 2 d. old, bred by Exhibitor.
990. Highly Commended, Russell Swanwick, of Royal Agricultural Farm, Cirencester, Gloucestershire, black and white, 5 m. 1 w. 4 d. old, bred by Exhibitor.

CLASS 89.—*Pen of Three Breeding Sow Pigs of a breed not eligible for the preceding classes, of the same litter, above* 4 *and under* 8 *months old.*

994. First Prize, £10, George Chapman, of Seamere, Yorkshire, white and blue, 7 m. 2 w. old (middle), bred by Exhibitor.
993. Second Prize, Richard Elmhirst Duckering, of Northope, Kirton-Lindsey, Lincolnshire, "Faith," "Hope," and "Charity," 7 m. 2 w. 1 d. old (middle), white, bred by Exhibitor.

WOOL.

CLASS 90.—*Six Long-Woolled Hog Fleeces.*

14. First Prize, £10, to John Rowles, of 14, Lower Hastings Street, Leicester (Leicesters), grown by Mr. Bishop, Sutton-in-the-Elms, Leicestershire; shorn May 18th.
18. Second Prize, £2, Christopher Barroby, of Baldersby, Thirsk, Yorkshire, (Leicesters), grown by Exhibitor; shorn May 22nd.
17. Commended, Charles Bosworth, of Dishley, Loughborough, Leicestershire (Leicesters), grown by Exhibitor; shorn May 25th.

BUTTER.

CLASS 91.—*Six Pounds of Fresh Butter in One Pound Lumps.*

23. First Prize, £5, to the Agricultural Colony, Coalville, Leicester.
22. Second Prize, £2, to the Rev. George W. Straton, of Aylestone Rectory, Leicester.

SPECIAL PRIZES,

AMOUNTING TO £100.

OFFERED BY THE SPARKENHOE FARMERS' CLUB.

CHEESE.

CLASS 92.—*For the Best Six Cheeses exceeding* 45 *lbs. each.*

37. First Prize, £10, to Francis Spencer, of Claybrook Magna, Lutterworth, Leicestershire.
39. Second Prize, £7, to William Neal Berry, of Stoke Golding, Hinckley, Leicestershire.
38. Third Prize, £3, to Tom Cattell, of Bitteswell Field, Lutterworth.

CLASS 93.—*For the Best Six Cheeses, exceeding* 35 *lbs. each, but not more than* 45 *lbs.*

50. First Prize, £10, to Samuel Wykes, of Aston Flamville, Hinckley.
57. Second Prize, £7, to William Trivett, of Market Bosworth, Leicestershire.
45. Third Prize, £3, to William Nuttall, of South Croxton, Leicestershire.

CLASS 94.—*For the Best Six Cheeses not exceeding* 35 *lbs. each.*

68. First Prize, £10, to William Ward, of Attleborough Gorse, Nuneaton, Warwickshire.
67. Second Prize, £7, to Samuel C. Pilgrim, of Out Woods, Burbage, Hinckley.
59. Third Prize, £3, to John Harding, of Atterton.

CLASS 95.—*For the Best entry in the above classes.*

50. First Prize, £15.

CLASS 96.—*To the Dairymaid or Servant who has manufactured the best entry.*

50. First Prize, £5.

CLASS 97.—*For the Best Six Stilton Cheeses.*

75. First Prize, £10, to Ezra Peel Smith, of New Parks, Leicester.
72. Second Prize, £7, to Thomas M. Evans and John Stafford, Campbell Street, Leicester.
76. Third Prize, £3, to William Stannage, of Twyford, Melton Mowbray.

Review.

Quid sit pulchrum, quid turpe, quid utile, quid non.—Hor.

The Treatment of our Domesticated Dogs. By Magenta, author of the 'Handy Horse Book.' William Blackman and Sons, Edinburgh and London.

Perhaps if we remark, in the first place, that the little volume with the above title is dedicated "to the memory of Charley, a Scotch terrier, our pet of pets, by his master," we shall convey about as good an idea of the predilections of the writer as the reader will be likely to gain from reading the book.

"Magenta" writes about dogs "as if he loved them," and with a *ladylike* fondness too; witness the following passage:

"A very dear dog of our own contracted a serious and painful internal complaint, and was ordered by his doctor to have hot-water bottles in his bed at night during cold weather. A large box was consequently made, with several good-sized air-holes in the cover; and when cold the little fellow regularly went to bed with his hot bottles."

To those who are not particularly "doggy" in their fancies the suggestion to put a dog to bed with hot-water bottles is slightly startling; albeit we admit that the idea is worth remembering in the treatment of the ailments which attack those pets of pets, who, as their fair owners say, require as much care as if they were infants, and we venture to add commonly get more.

The writer's fondness for his dogs does not blind him to their faults, nor lead him to sanction silly indulgence of their sometimes ill-regulated appetites. He objects to the animals being "nursed, lapped, or carried about," and even ventures on the following merciless recommendation:

"Dogs, on the contrary, for their own sake, if not for that of the furniture (and these cruelties are inculcated by one who values the former as much as the latter) ought to be made to lie exclusively on the *floor* when indoors in the daytime."

Then we have minute directions on properly correcting an obnoxious pet whose manners require amendment. The remarks on feeding and general management of the domesticated or indoor dog, if we may use the phrase, are very

judicious, but as they advocate a system that is directly opposed to the one which is generally adopted, they will probably receive very little attention. We can fancy the feelings of a lady who is advised to feed "dear Tiney" *once* in twenty-four hours; the advice is good notwithstanding; and if all the suggestions which the author makes are carefully carried into effect by the master or mistress of a favorite dog, the animal will be physically the better for the treatment which he will receive. One paragraph in the book ought to be written in brass on every dog's collar:—"The habit of begging or scratching at people when they are eating is very troublesome, to strangers, at all events; and as dogs have no company manners, they must be taught always to remain quietly under the table or chairs till their own dinner is ready. We regard it as a duty to abstain from making either ourselves or our friends slaves to our domestic pets, however valuable and dear they may be."

With keen recollections of what "strangers" feel under the painful circumstances depicted in the above quotation, we feel inclined to bless "Magenta" for his noble interference on behalf of suffering humanity.

Extracts from British and Foreign Journals.

THE ATMOSPHERIC GERM THEORY.

(*A Lecture delivered to the Royal College of Surgeons, January* 17, 1868.)

By John Hughes Bennett, M.D., F.R.S.E., Professor of the Institutes of Medicine and Senior Professor of Clinical Medicine in the University of Edinburgh, &c. &c.

(*Concluded from* p. 455.)

In the same manner, air and infusions exposed to intense cold still produce animalcules, but, according to Pasteur, not so readily. Twenty flasks containing boiled infusions, and from which the air was expelled, were opened by him with excessive precaution on the Mer de Glace at Montanvert on the Jura. Notwithstanding the purity and extreme coldness of the air, infusoria appeared in five of his flasks.

As an illustration of the manner in which the controversy on this subject has been carried on in the Imperial Academy

of Sciences in Paris, I may give a short account of that portion of it referring to the Glacier experiments. MM. Pouchet, Jolly, and Musset opened eight similar flasks used by M. Pasteur at Montanvert, on the Glacier of the Maladetta, in the Spanish Pyrenees, 9000 feet above the sea, and 3000 feet higher than that of Montanvert, using all the precautions required by M. Pasteur. In addition, before cutting off the ends of their hermetically sealed tubes with a file, previously heated by a lamp, they held the flasks above their heads. Notwithstanding, infusoria appeared in all the infusions a few days afterwards.*

To this communication, presented to the Academy Sept. 21st, 1863, M. Pasteur replies Nov. 2nd,† saying that he is rejoiced that his learned adversaries have gone to such an altitude to repeat his experiments, but observes that they did not take the necessary precautions. They only had eight flasks, whereas he had twenty; they shook their flasks before opening them, which he took care not to do; and they had the imprudence to use a file, instead of a pair of pincers with long branches, heated in the flame of a lamp. He says that the thumb and fingers holding the file were too near the opening into the flask, and may have conveyed germs there, especially as they were not passed through the flame, as the file was.‡ He defies them, if they take sufficient precautions, to obtain infusoria in all their flasks.§

MM. Jolly and Musset accept the defiance of M. Pasteur Nov. 16th;‖ and, in fact, on the 13th June following, they send a memoir to the Academy, stating that they had returned to the Maladetta, this time with twenty-two flasks—that is two more than were used by M. Pasteur—fulfilled all his conditions, not forgetting the pincers with long branches, properly heated, and found that infusoria appeared in every flask without exception in four days,¶ and so ended this part of the controversy.

Numerous other important questions have been debated before the Academy; among these are the changes which take place in the air confined in the flasks, founded on numerous analyses;** the observations of Jolly and Musset with regard to vibrios living in distilled water;†† the statement by M. Pasteur that neither free oxygen nor atmospheric air are necessary for the growth of infusoria,‡‡ and that they will

* 'Comptes Rendus,' tome lvii, p. 558.
† Ibid., p. 724.
‡ Ibid., p. 725.
§ Ibid., p. 726.
‖ Ibid., pp. 842—845.
¶ Ibid., lvi, p. 1122.
** Ibid., pp. 734—739.
†† Ibid., lv, p. 491.
‡‡ Ibid., li, pp. 345, 346; liv, p. 267; lvi, p. 1191.

develop themselves in carbonic acid gas only. Lastly, the same chemist declares that, notwithstanding his often declared opinion that ferments are living beings and not dead matter, he can produce fermentation with the ashes of yeast.* Some of these statements are confirmed by Donné,† who found that hens' eggs became putrid without the formation of vibrios or other infusoria. This observation, while it might serve to prove that atmospheric air passing through the egg-shell separated the germs by filtration, is wholly opposed to the idea that putrefaction is necessarily caused by such germs.

The only conclusion I can draw from the numerous contradictory and ingenious communications presented to the Academy of Sciences during the last eight years on this matter is, that not the slightest proof is given by the chemists, with M. Pasteur at their head, that fermentation and putrefaction are necessarily dependent on living germs existing in the atmosphere. They rather tend to show that these are phenomena of a chemical nature, as was ably maintained by Liebig.‡ Did we indeed confine our reading to the papers of M. Pasteur—that is, to one side of the case—we could easily persuade ourselves of his correctness;§ but every one of his experiments has been repeated by several independent investigators, who have shown his imagined proofs as to the existence of atmospheric germs to be altogether erroneous. We may conclude, therefore, that living germs are not necessarily the cause of putrefaction and fermentation; neither is it necessary to believe that ferments are living at all—they may be dead. This, if not admitted, seems to be implied by Pasteur himself, who tells us he can now excite these processes, not by fresh yeast only, but by the ashes of yeast.‖ That they may be induced by dead organic matter, which has been subjected to a direct temperature of 150° or 200° Centigrade—a heat utterly incompatible with the existence of life—we have seen to have been proved by Pouchet, Jolly, Musset, and others.

* Ibid., lvi, pp. 418, 419.

† Ibid., lviii, pp. 951, 952; lxv, p. 602.

‡ 'Letters on Chemistry,' letters 18 and 19.

§ This is what unfortunately seems to have been done by the Commission of the Academy, which made a report on this subject, Feb. 20, 1865 ('Comptes Rendus,' tome xi, p. 384). No histologist was on the Commission, which refused to enter upon any kind of microscopical inquiry; Messrs. Pouchet, Jolly, and Musset, under such circumstances, very properly took no part in the investigation, which, consequently, was altogether one-sided, and of no scientific value.

‖ 'Comptes Rendus,' tome lvi, pp. 418, 419.

The idea that these imaginary germs were the cause of putrefaction, of disease, of blights among vegetables, and other evils, originated with Kircher and the pathologists of the seventeenth century. It has been frequently revived, but always shown to be erroneous. In 1852 cholera was supposed to be occasioned by a fungus that really existed in the dejections, but which Mr. Busk pointed out was the uredo segetum of diseased wheat, which entered the body in the form of bread. Certain well-known parasitic diseases are spread by contact, such as scabies, which, as it depends upon an insect burrowing in the skin, may be understood to crawl from one person to another. Favus, also, I succeeded, in 1841, in proving might be made to grow on diseased surfaces of otherwise healthy persons; but many of our unquestionably infectious diseases, such as smallpox, scarlatina, measles and typhus, have no such origin. It has been attempted to be proved, indeed, by Lemaire,* that in the condensed vapours of hospitals and other putrid localities, vibrios may be found; but that vibrios are the cause of these various diseases, is not only not proved, but, from what has been stated, is highly improbable.

What, then, it may be asked, is the origin of the infusoria, vegetable and animal, that we find in organic fluids during fermentation and putrefaction? In answer to this question, I say they originate in oleo-albuminous molecules, which are formed in organic fluids, and which, floating to the surface, form the pellicle or proligerous matter. There, under the influence of certain conditions, such as temperature, light, chemical exchanges, density, pressure, and composition of atmospheric air, and of the fluid, &c., the molecules, by their coalescence, produce the lower forms of vegetable and animal life.

Hallier, describing the development of *Penicillium crustaceum*, tells us that, after all movement in the primary molecular mass has ceased, the molecules arrange themselves in long lines, which he calls Leptothrix chains (fig. 1, *f*). From the melting together of these, the delicate filaments forming *Leptothrix buccalis* are evidently produced; and these, according to him, by further development, pass into *Penicillium crustaceum*.† Why the molecules should sometimes arrange themselves in long rows, and at others into rounded masses (compare fig. 1, *a*, and *f*), is probably dependent on varying degrees of limpidity and viscosity. But why both these germs should sometimes possess an inherent

* Ibid., tome lix, pp. 317—428.

† 'Gährungserscheinungen,' p. 51, and fig. 12. Leipzig, 1867.

power of contractility, and at others not, it is impossible as yet even to surmise. But on the determination of this point, the variations existing between the different kinds of fermentation and putrefaction are evidently dependent.

But the ultra-vitalist will ask, If so, what becomes of the doctrines—"Every living thing from an egg;" "Every cell from a cell;" and "All life from life"? To this I reply, these expressions are formulæ, which only impose upon the understanding, check the search after truth, and are already completely overthrown by the advance of science. A few words with regard to each of them will, I think, show this.

I.—After what has been said, I need not dwell upon the first of these views, viz. *omne vivum ex ovo*, for the facts we have described are quite hostile to it.

II.—That every cell comes from a cell, is a recent doctrine, which, from its first enunciation, was rejected by almost all the first histologists of Europe. The illustrious founders of the cell theory, Schleiden and Schwann, clearly showed that primary cells originated in a molecular mass which they called a blastema. Max. Schultze in 1861,* and Bruecke in 1862,† demonstrated that a cell-wall had nothing to do with the development of molecular masses, and now it is not considered essential to the conception of a cell by the most inveterate cellulists. Having thus discarded from this far-famed elementary organ its external wall or boundary —which can alone entitle it to be called a cell at all—they have only to carry their conceptions a step farther, and banish the nucleus also. There will then remain an organic fluid or molecular material, the true potential substance, in which all growth takes its origin.

That molecular, nuclear, and cell forms are not necessarily organic has been proved by the researches of Ascherson,‡ Rainey§, and Montgomery.‖ They have succeeded in producing from various viscous substances, more especially oil and albumen, different kinds of gums,¶ and a material obtained from yolk of egg called protagon, appearances resembling almost every kind of elementary texture. The idea that there are such things as histological organic forms, which are necessarily indicative of life, must now be regarded

* Reichert and Du Bois-Reymond's 'Archiv,' 1861, p. 9.

† 'Sitzungsberichte der Kaiserlichen Akademie der Wissenschaften,' 1862, p. 382.

‡ Muller's 'Archiv,' 1840.

§ 'Mode of Formation of Shells,' &c., London, 1858.

‖ 'The Formation of so-called Cells,' &c., London, 1867.

¶ Rainey, in 'Medical Times,' January, 1868.

as fallacious. It has deceived many, and among the rest, as we have seen, M. Pasteur. What now interests us are the transformations which these forms undergo, and the passage of one into the other. This inquiry must lead us to the molecular theory of organization, which inculcates that all the tissues are formed by the successive production of histogenetic or formative, and histolytic or disintegrative molecules;* and it appears to me that its correctness is singularly confirmed by the investigations that have been brought before you this evening. In short, we have first molecular depositions in organic fluids; these aggregate to form nuclei, cells, and other tissues; and these again, by constantly breaking down and re-forming, gradually elaborate and build up the higher organisms. It would appear that nature is constantly operating in the organic and inorganic worlds by the process of molecular coalescence; that the notion of every particle being necessarily derived from its like is erroneous; and that the law of descent from parents, which we recognise in the higher animals, changes, as we descend in the scale, first to *parthenogenesis*, whereby this direct descent is broken, and ultimately to *heterogenesis*, in which it is lost.

This theory irresistibly recalls to our recollection the philosophical speculations of the Greeks, and especially of Democritus, Anaxagoras, and Empedocles, and suggests to us that history in science, like history in morals or in politics, often repeats itself, so that our predecessors may often be regarded not only as the originators of speculative opinions in the past, but also as prophets, who have foretold in the cycle of events the deductive truths of the future.

III.—The doctrine that life must necessarily spring from life is essentially connected with the view of direct descent from parents. Previous to the time of Harvey, life was considered to be an independent principle, capable of being added to or removed from inert matter. Such was the opinion of the ancient philosophers, as allegorically explained by the fable of Prometheus, who animated the marble statue by fire stolen from heaven. In later times, Buffon imagined life, like matter, to be indestructible. According to him every living molecule had a life of its own, and the method by which it manifested its function depended on its association with other molecules. Thus, the body of an animal or a plant was the aggregation of a multitude of minute living beings arranged in a particular way. The death of the complex

* See the author's paper on the "Molecular Theory of Organisation," 'Proceedings of the Royal Society of Edinburgh,' April 1, 1861; and 'Microscopical Journal,' 1861.

compound was simply a dissolution of one of these associations, and the organic molecules thus set at liberty wandered about until they once more combined with a plant or animal—here with a monad, there with a quadruped. The *materia vitæ diffusa* of John Hunter was something similar.

Our modern view of life is, not that it is independent of matter, but a condition of matter; in other words, that material substances found in the atmosphere, and in plants and animals, influenced by certain forces, have peculiar properties communicated to them. These properties are contractility, sensibility, the power of growth in certain directions, and mental acts, the exercise of any one of which constitutes life. That accidental causes are capable of communicating one or more of these properties to tissues that did not previously possess them, is certain. Thus, exposure to light may influence the movement of the pigment-molecules in the skin of the frog and other animals, so that it at once becomes dark or light.* The entrance of a spermatozoid into the ovum—that is a vibratile fibre, much like a vibrio, pushing a molecule before it—excites those changes in the yolk which produce an embryo. An unimpregnated uterus is not contractile, but if impregnated its fibres have a vital property communicated to them for a purpose, and they expel the fœtus. I think no one can doubt that an aggregation of molecules produces a vibrio, which, at first motionless, has contractility communicated to it, and thereby lives.

M. Onimus has shown, by careful experiment, that if the clear serum from a blister be placed in a bag of gold-beater's skin, and put below the skin of a rabbit, so as to be exposed to warmth and endosmotic currents, bodies like pus or the colourless cells of the blood, called by Robin, Leucocytes, are formed. He has even filtered the fluid, and shown that they arise spontaneously by molecular deposition, so long as the fibrin it contains is not coagulated. Hence, he says, all substances which produce coagulation—such as alcohol, corrosive sublimate, iodine, to which we may add carbolic acid—prevent such purulent formations. Their production, however, he points out, is identical with that of molecular growth. He further ascertained that when white of egg or fresh blood was placed in a glass vaccination tube, or vessel deprived of air, they did not putrefy; but if placed in a sac of gold-beater's skin, although not exposed to fresh air, they shortly putrefied, and contained numerous vibrios. In the first case, he says there is no exchange of air between the organic substances

* See Professor Lister on the "Cutaneous Pigmentary System of the Frog," 'Phil. Trans.,' 1858.

and the fluid, under which circumstances no organic forms are produced. He therefore maintains that vibrios and fungi in fluids are not the result of atmospheric germs, but of conditions necessary to the putrefaction of organic fluids.*

These conclusions are confirmed by the numerous facts which have long been recognised in pathology,† and indicate that it is to a knowledge of these conditions that science must now apply itself. So long as the origin of infusoria was ascribed to atmospheric germs, we rested contented, and all inquiry was stopped. I shall be satisfied if, in supporting another doctrine this evening, I have stimulated even one inquiring mind to investigate the truth.

Gentlemen, I see by the public papers that a great legal authority in this city has been lecturing on the contradictions which exist among scientific men, and the want of proper evidence leading to their conclusions. He complains, also, that he everywhere sees a tendency to place new scientific views in opposition to religious beliefs.‡ I shall not reply to his good-natured criticisms by dwelling on the glorious uncertainties of the law, but shortly point out, in conclusion, that the theory I have placed before you this evening should recommend itself to the Biblical student. Man, he learns, was created from the dust of the earth, and he may well ask—why should such molecular matter have been chosen for the purpose? How many histogenetic and histolytic transformations it underwent before the form was perfected, he is not told; but being made, it is distinctly said that living properties were added to it. He is nowhere taught that life invariably springs from life. On the contrary, the great doctrine everywhere impressed upon him is, that life springs from death. "Thou fool," says St. Paul, "that which thou sowest is not quickened unless it die." In quoting this remarkable passage, I do not seek from it scientific evidence at all, but I believe it contains a deep philosophy consistent with all kinds of development—religious, moral, political, and certainly physiological. There is a manifest inconsistency in supposing that the same kind Providence which alone can create life should have done so once only in ages past. The idea that a seed can retain vitality for thousands of years has hitherto been a stumbling-block to physiologists. What it really pos-

* 'Journal de l'Anatomie et de la Physiologie,' 1867, p. 47.

† See the author's 'Clinical Lectures on the Principles and Practice of Medicine,' 4th edition, more especially pp. 164, 182, 233, 689.

‡ 'Address by the Right Honorable James Moncreiff, Dean of Faculty,' &c., 14th January, 1868.

sesses is a certain arrangement of dried molecular matter, which, when exposed to peculiar conditions, enables it to exhibit the vital property of growth. The truth seems to be, that new life springs from the molecular death of pre-existing tissues and organisms. The vibratile and germinal molecules concerned in the process are not new productions, but old ones; and these, submitted to conditions which it is the office of the physiologist to investigate, undergo a rejuvenescence, and enter into and constitute the living substance of the new being. This theory, I venture to think, is not only consistent with all known facts, but unites in one grand conclusion the physiological science of the present day, the intellectual speculations of ancient Greece, and the direct teachings of our sacred records.

TOWN MILK. By John Chalmers Morton.

The following report on this subject is based upon a paper on the "London Milk Trade," which was read two years ago before the Society of Arts, and was reported in their Journal of December 15th, 1865. Since the preparation of that paper, and the examination then made of cowhouses in various parts of London, I have had charge of a suburban farm, where a large number of cows—at one time more than 250—were kept exclusively for the London milk supply. This, with a renewed examination of a few additional town and suburban dairies, enables me to speak with some confidence on a subject which is of considerable agricultural and of very great social consequence.

The latter consideration is not sufficiently regarded, for the importance of it can hardly be overrated. "The returns of the Registrar-General exhibit a fearful tale of infant mortality; and a large proportion of the various causes of death assigned in them may be summed up," says Dr. Druitt, Medical Officer of Health to St. George's, Hanover Square, "as simply meaning starvation." The milk supplied in shops has, in fact, been to a large extent deprived of its nutritive elements; and, "little more than the thick curd remaining, the delicate stomach of a child cannot digest it; and hence diarrhœa, atrophy, and the multitudinous diseases which tell so terribly on infant life in towns." And not only is there a result of this intermediate kind contingent on the non-supply of unadulterated milk, but, as Mr. Chadwick has

pointed out, the health and strength of the whole future life are compromised by it. "The foundation of the adult is laid in childhood and youth. Our strongest and best labourers are from milk-and-oatmeal fed, or milk-and-bread fed, or milk-and-potato fed children. Our strongest navvies are from the hill districts of Lancashire; our strongest labourers from Cumberland and Westmoreland, and from the hill districts of Scotland, where milk is always a large portion of the food of the family. These, too, are the favorite recruiting-grounds for guardsmen and soldiers of the greatest size and strength."

If mothers sufficiently realised the future consequences of insufficient nourishment in infancy, they would be quicker to recognise the causes of those ailments which are current during the time when this process of imperfect feeding is going on. No doubt there are, however, many examples of this quickness; and I met with one the other day in the case of a poor woman purchasing a pennyworth of milk in a shop where it has never been adulterated or diluted, for which every day she was content to walk a mile, saying that it was "four times better" than any she could get close by her house; and the life of her child depended on it. The stomach of a child is an unquestionable test of the quality of its food; and she had been rightly guided by its indications. But the verdict of the analyst may be also trusted—more confidently, perhaps, in the case of milk than in that of any other food. A mere aroma, which the balance of the chemist cannot weigh, may, indeed, sometimes destroy the value of milk, as of other food; but that is easily recognisable without analysis: and varieties of mere texture, which sometimes upset, as to any practical guidance they may offer, the conclusions of the analyst, after he has examined other foods, are unknown in the case of milk. Dr. Voelcker's analyses, published in past volumes of this Journal, as well as elsewhere, are thus directly serviceable, teaching us with definiteness and in detail a lesson which, however, experience has already taught many of us more generally, that milk, whether good or not, when coming out of London cowhouses, is very often impoverished and adulterated when served over London counters.

The *British Medical Journal* of November 23rd, 1867, called attention to a more recent series of analyses by Dr. Voelcker, which very strikingly illustrate this fact; and a short reference to his results will suffice to prove the first point to which I am directing attention, viz. that town milk is very often most outrageously and mischievously robbed and maltreated before it reaches the consumer. Ten samples

were submitted to examination, taken from shops in Blackfriars, the Strand, St. Giles's, and some of the western districts north and south of Hyde Park. Of these only one was just as the cow had yielded it. It contained 86·16 per cent. of water—rather less than the ordinary natural proportion, and 12 per cent. by measure were cream. The other samples contained from 90 to 91 per cent. of water, and from 9½ to only 3 per cent. were cream. The price in every case but two was 4*d.* per quart; in those two it was 5*d.*; and there the quantity of cream was only 4 and 6 per cent. respectively! How great the temptation to dishonesty, and how great its facility, are both apparent from these analyses. A large business in "a first-class establishment" is prospering, which sells as new what is "no better than skim-milk." The reports regarding the other cases are as follow:—"much coloured artificially, one fourth of cream removed, and one sixth of water added;" "one fourth of cream removed, and one third of water added;" "skim-milk, with one third water!" "one third cream removed, and one fifth water added." If 4*d.* per imperial quart be the price at which milk can fairly be sold retail, then in one of these instances, where it was sold at 5*d.* after one third of the cream was removed and one fifth water added, no less than £20 per annum profit, beyond that of the fair retailer, is made for every gallon sold per diem; and if 100 gallons be sold daily there is the enormous premium of £2000 per annum realised by this dishonesty.

This, then, is the first point for consideration in any discussion of town milk—the great temptation which is offered in the trade to dishonesty, to which dealers very often yield with lamentable consequences to their customers, especially when the milk is bought for the nourishment of young children. But the *Agricultural Journal* is hardly the place for a detailed examination of this part of the subject, and I will conclude by quoting the letter of one recently in the trade, who has had the best opportunity of forming an opinion. He says—

"I suppose it is allowed on all sides that the London milk trade is not what it should be, and that very little pure milk is sold, especially to the poor. Before attempting to remedy this great evil the causes must be ascertained. With the poor, milk is a necessary more than a luxury; and, if pure, it is a most valuable article of food. As sold to the poor it yields a much greater profit than to the upper classes, as the former nearly always 'fetch' it themselves, and thereby save the milkman the expense of distribution, which at a West-end shop costs about ¾*d.* a quart for a wide-spread business, and ½*d.* for a compact one; and besides this, the rent in a poor district is so much lower. But in spite of all this the poor are the worst

served, and the reason is that the trade among them has fallen into the hands of such very 'small' men, who sell so little that the business cannot yield a maintenance without help from the 'cow with the iron tail.' These same small men cannot contract with a country farmer for his milk, and therefore are in the hands of the wholesale dealers. The wholesale dealers, again, give only so low a price to the farmer that he in his turn, to make it pay, must add a little water.

"And if you go below the labouring class to paupers, they are treated worst of all. We have tendered for five or six workhouses at a price which would have given us a profit of less than one farthing a quart, and yet we have not been accepted. Tenders of 1*s.* 4*d.* a barn gallon (8 quarts) have been accepted, or 4d. a barn gallon less than our milk now costs us at our shop; and we are only paying the market value of pure milk in large quantities. We have had men in attendance at the opening of the tenders, and it was evident that it was all settled beforehand who was to have the contracts, as the outsiders knew well before it was announced. The fact that a dealer offered to buy a large quantity of our 'skim,' avowedly to supply a workhouse contract for 'new,' shows what the paupers really get.

"Next, as regards the upper classes, the expense of distribution is so great that only a very small margin is left for profit on each quart; but, on the other hand, the businesses are generally large. The bar to the sale of pure milk among the better classes is the system of percentages to servants. They all expect 5 per cent. on the gross amount of their masters' bills, and this is just about what would be net profit on an honestly conducted West-end business. If this is not paid the milkman is 'worked out.' So, to avoid this unpleasant process, he commences by adding water sufficient to pay this tax, and as that seems to pay well he soon doubles the quantity. We lose two or three customers a week from the servants, but we continually get more new ones, as pure milk will draw in spite of all this.

"The different causes which I have enumerated above have gradually made the milk trade one of the most dishonest in London, and I believe few in it now ever make the effort to be honest.

"I have forgotten to mention one of the most rascally tricks of it, which deserves exposure. I mean the selling cream in quantities short of imperial measure. When we began our business we were forced to have cream-cans of correct measure made on purpose, as the tinman assured us that no dairyman in London sold cream except in measures 25 per cent. short, and consequently he had no others. We have found this to be true by measuring the cans of many other dealers. The milk, however, is sold in proper measures."

I now turn to what may be called the agricultural side of my subject.

Purchase of a Cow.

The art of producing milk with profit depends on the selection of a cow and of food for it, on housing her comfortably, and on treating her with gentleness and regularity. On the selection of a cow, of course, depend both her current produce and her ultimate selling value. She should not be a very young cow, because her milk is not then at its full yield; and she should not be a very old cow, because there is then great difficulty in fattening her. The general practice is to

buy one, if possible, immediately after her third, fourth, or fifth calf; and then to keep her on till she does not yield more than six quarts of milk a day. When her milk begins to shrink she will generally put on flesh on the same food that she has been all along receiving; but towards the end of the process three or four pounds of oilcake are given, in addition to the ordinary food; and the upshot is, that if she was bought for £20 she may sell for £17, up to even £19, after a milking which shall have lasted on an average from eight to ten months. During the last few years, when a good cow has been worth £20 to £25, and markets for second-class beef have been very dull, there has been a loss on buying and selling of £4 or £5 a head; and this is not merely a loss per annum; it is a loss upon nine months, amounting, therefore, to one third more per annum; so that it is thus often equal to a loss of £6 or £7 per annum on every stall in the cowhouse, which is a serious and may be a ruinous discount from the returns of the cowkeeper. It is plain, then, that in the case of this business, even more than in that of ordinary stock-farming, everything depends on skill and judgment in marketing.

In the better class of London cowhouses you see large-framed, wide and straight-backed, deep-bodied, short-horn cows, equal for size and mass and ability to carry meat, as well as yield milk, to any cattle in the world. They may have cost £20 to £25 a piece on entering. Elsewhere you see small Irish and Dutch cattle—cows that have cost £13 to £15 a piece on entering the cowhouse, and will sell for £10 to £12 on leaving it. In both cases it has been customary for the cowkeepers to attend country fairs and markets and importers' yards, and pick up a cow here and a cow there as they could. It has also been a common thing for the London cowkeepers to purchase of the dealers, Bruce Johnson, of Finchley; Judkins, of Islington; C. Roach, of West Hampstead, and others. At present cows are brought close up to the edge of the metropolitan district; cowkeepers hear of them,* and they are purchased out of some wayside lair, and driven straight to the stall without entering the market; and after serving their time, perhaps eight or ten months, and yielding at first, it may be, sixteen and at length six quarts of milk a day, they go to the metropolitan market, and are sold to the butcher, in whatever condition as to fitness they may be. The dealers tell you that buyers invariably look to the prospect of a good sale when they buy, and that

* Many cows are sold on the arrival of the trains, being purchased of the dealer in the truck, or immediately after leaving it, in the street.

a cow which will "feed" as well as milk is essential to profit. The consequence is, that the preparation of cows for the London market is a general practice in many dairy districts. Cows which are on the point of becoming too old for ordinary dairy usefulness are thus fed so as to be half fat at the time of calving, and Mr. Bruce Johnson's agents pick them up in this condition all over the northern and midland counties; and a finer lot of beasts is rarely to be seen than are offered weekly throughout the year at the Finchley Manor Farm. The attempt is made by liberal feeding and warm housing to retain this flesh, with which they enter the cow-house, and add to it so soon as the milk begins to shrink, so that by-and-by the cow is sold weighing 7 cwt. or 8 cwt., fetching almost as much as was given for her. I have, indeed, seen before Christmas time a byre full of cows in Chelsea still giving four and five quarts of milk apiece a day, which must have been worth £28 to £30 apiece for the beef they carried. That is one style of management. The cows sold out of the Somersetshire, Wilts, Gloucester, and Berkshire dairy districts do not come up so fat—do not fetch such large prices at the beginning—milk probably rather longer, as a rule, than the others, but lose more on being sold; or if they sell like the others, at a loss of £2 or £3 a piece, yet that being a loss upon £16 or £18, instead of on £20 or £22, is a larger loss per cent. The foreign and Irish cows, both of which are met with more frequently now than formerly, are bought much cheaper than the others, and are often very good milkers; and though they are sold for considerably less at the end of their milking (for little or no attempt is made to fatten them), yet the loss, greater than usual, perhaps, upon every £100 of their purchase-money, is not, probably, so great in reference to the quantity of milk which has been produced by the animal; and this, after all, is the true test of economy.

Food of the Cow.

Having got your cows well purchased, the point of next importance is to feed them properly. Their invariable food in London cowsheds is grains (brewers' or distillers' grains, the spent barley or other grain after being well washed or "worked out" in the process of brewing and distilling), with mangolds and hay in winter, and grass in summer. When first the cow is received into the shed it is important that she be gradually accustomed to her new food. She should therefore receive, during the first week, little but green food,

grass, or clover or vetches, in the summer, and mangolds and hay in winter, with bran mashes, into which grains may be gradually introduced, until, as she takes to them, she may at length be treated as the others are. What this management generally is I take from the statements of two men, neither of them very large dairymen, but both of them successful managers. Mr. Sumpton, of Little Warner Street, Clerkenwell, who usually milks about thirty cows, describes his day's work as follows:—The cowmen enter the shed at 4 a.m., and proceed to milk. In the case of the wholesale milk trade, when the dealers who buy the milk do the milking, one good man suffices for thirty cows. The cowman then only helps, if necessary, at milking time, and sees that the work is thoroughly done,* his main business being to feed and tend the cows. When not only milking, but serving the customers at shops and houses has to be done, three men are required for thirty cows. They begin milking at 4 a.m., and finish between 5 and 6. About a bushel and a half of grains is then given between each pair of cows, and they are partly cleaned out, and when the grains are done a truss of hay ($\frac{1}{2}$ cwt.) is divided amongst twelve. In the meanwhile the men have been serving the milk; after which they have their breakfast (about 8 a.m.). After breakfast time a bushel of chopped mangolds, weighing 50 lbs. or 60 lbs., is given to each two cows, and the cows receive another truss of hay amongst twelve. The cowshed is then cleaned out, and the cows are bedded and left. At 1 p.m. milking recommences, and very much the same feeding as before is given. At 2.30 grains are given as before, followed by the same quantity of hay, and then (and only then during the twenty-four hours) the cows are freely watered. They again receive a truss of hay amongst twelve, and are left for the night. The grains are either brewers' or distillers' grains; the former are as much inferior to the latter in value as they are in price—the one at present costing 3*d.* to 4*d.* a bushel, and the other 8*d.* and 9*d.* In the case of cows in heavy milk —also in the case of those rapidly losing their milk, which must be sent to market as quickly as possible—it is common to give two or three quarts of peameal mixed up with the grains morning and evening, each cow thus receiving that quantity daily. And when the milking is coming to an end,

* If he has any reason to suspect that a cow is not milked out, it is his duty to his master to "strip" her, for nothing injures a cow more than imperfect milking; and if he succeeds in getting another half pint from her his master will give him 6*d.* or 1*s.* for it, and fine the dealer that amount for his servant's default.

for three or four weeks before the cow is sold, she may receive 2 lbs. or 3 lbs. of oilcake in addition. A full bushel of grains, half a bushel of mangolds, one third of a truss of hay, and 5 lbs. or 6 lbs. of peameal, in the case of the fatting cow, are thus the daily ration in a London cowhouse. The grains at 2*s.* a quarter, the hay at £5 a ton, and the mangolds at 20*s.* a ton, cost 1*s.* 3*d.* a day, and with meal or cake the daily allowance may cost from 1*s.* 6*d.* to 1*s.* 9*d.* per cow—10*s.* to 12*s.* a week.

In summer time the food is grass with grains, and meal if necessary. Most cowkeepers, except the very smallest men, either have a small suburban farm, or buy a few acres of vetches, clover, or grass, and cart it in themselves. When it is bought daily at the cowhouse it costs from 1*s.* to 1*s.* 3*d.* a cwt. during the summer, and the cows receive about that quantity daily, given to them as fast as they can eat it, morning and evening, with their grains.

Of course the proper feeding of the cow after she has been well bought is the very essence of the business of the cowkeeper. It is a proof of good management when she is so treated that no kind of food which she receives shall pall upon her taste. The maxim is, never overdo a cow with any kind of food. Some cows are exceedingly greedy for distillers' grains, and they yield a very large quantity of milk upon them; but it is easy to "overdo" a cow with grains, and she should be always stinted of her favorite food, or she will get sick of it, as I have seen often enough in the case of this very article—distillers' grains.

I add to this the statement of Mr. Dancock, of Brompton, another successful manager of cows. He uses steam in the preparation of his cow food, and in particular gives his meal in the form of gruel over cut hay or grains, 1 lb. of meal being added to a quart of water, with a little salt. "My plan," he says, "is to fill with cold water an eight 'gallon' churn (holding twice that number of imperial gallons) up to the figure 7. This allows room for meal and steam. I then put the steam-pipe within six inches of the bottom, and supposing the pressure in the boiler to be 10 lbs., turn on full, and in five or six minutes the can is full and the gruel is done. I have sixteen cows, and my quantity is three cans, which allows one large pailful to each cow twice a day. I think this is better than giving them meal dry over grains. I milk before feeding, give one bushel of grains to a pair of cows twice daily with gruel over it, and when this is done give them green stuff and mangolds, a little hay if necessary, then water and rest till milking time again, when they are

fed as before with grains; then I give oilcake, about 3 lbs. between two cows, then water and do up with hay." Mr. Dancock adds, "Cleanliness is essential to health—white-washed walls, mangers well cleaned, cows well cleaned and littered down with short straw; in fact, everything belonging to cows and a dairy must be thoroughly clean to preserve health. This, combined with energy and attention, will in due time bring profit to the owner."

It may be right to give the daily rations in the case of the smaller Irish and Dutch cows which are seen in some of the smaller town dairies. Mr. Mosey, of the Albion Dairy, Barnsbury, whose cows cost him from £10 to £18 apiece, milks at 4 and 5 a.m., gives so large a quantity as a bushel of grains to each cow at 6 a.m., and in winter 7 lbs. of hay at 9.30; as much water at 10 as they will drink, say six gallons (imperial) apiece, and one bushel of mangolds at 11. He milks again at 1 p.m., and the cows get another bushel of grains apiece at 2 p.m.; 7 lbs. of hay at 5, and afterwards water if required. In summer they receive the same grains and hay as in winter, with grass, vetches, or green clover afterwards, both morning and afternoon.

The suburban cowkeeper, though more favorably situated than the London dairyman, as regards the bulk of the food he consumes—the grass, the mangolds, and the hay—is less favorably situated as regards grains; and this disadvantage, combined with the other of distance from the consumer, is such as at least to balance, often to overbalance, any advantage he possesses over the town dairyman in respect of labour, rent, and cheaper farm produce. Going further afield, as for example, to Swindon and beyond it, or to distant stations on the South-Western and North-Western Railways, you find that the farmer feeds his cows for London just as he has hitherto done for cheese or butter dairying. Bringing them to the pail at all months of the year, so as to have a regular produce to meet his contract with the London dealer, he milks his cows out at pasture during the summer, and feeds them on hay and mangolds in the winter. Receiving $6\frac{1}{2}d.$ to $8d.$ per imperial gallon for the milk delivered at the nearest station, and getting 500 to 550 gallons from his cow per annum, he receives £15 to £18 per annum for her produce, which is more than he can generally make of it in the form of cheese or butter, at the same time that he avoids all the cost of labour in the dairy. He runs, however, especially during hot weather, the risk of the milk souring on its journey, in which case it is thrown away on its arrival at his expense. But by cooling it before it starts, this risk is very

much diminished; and this is done either by standing the full can ("churn" is the technical term for it) in running water, or by placing the milk, before filling it into these cans, in large tin vessels, surrounded by cold water, and traversed by cold water pipes. The risk is further diminished by filling the cans so that they shall not shake, and covering them with wetted jackets, so that evaporation may help to keep the contents cool. There is, however, great difficulty in ensuring its arrival sound after a long journey in hot weather, during which it has been in a constant tremble, which is just the condition likely to promote chemical change. The evening's milking in the case of distant country farms arrives in London about midnight, ready for the London breakfast tables, and the morning's milking reaches town in time for tea.

Nearer London the management is very like that of Clerkenwell and Chelsea, already described, excepting that to give time for the transmission of the milk everything begins an hour or two earlier. Mr. Collinson Hall, of Navestock, near Brentwood, describes his cow-house management as follows:

"We begin milking at one o'clock in the morning; each man should have fifteen cows. The milk arrives at five o'clock in London. The cows are again milked at ten o'clock, and the milk is in London at one o'clock.

"They are fed as follows:—Each man gives about 4 lbs. of meadow hay to his fifteen cows after the midnight milking, and then goes to bed. At seven o'clock he gives them half a bushel of grains mixed with a bushel of sweet chaff, and a handful of salt; the cows are then cleaned and fresh littered; 2 lbs. of hay apiece are given, and at eleven o'clock one bushel of mangolds are given; at four o'clock p.m. one bushel of grains and chaff; and at six about 2 lbs. or 3 lbs. of hay. The cows are not untied, that they may not mix together, and their water is carried to them. We feed often, and avoid giving large quantities at once.

"Lime on the floors, gas tar enough not to be offensive, and ten drops of arsenicum (third dilution) in the drinking water, great cleanliness, and all the provender good; not putting too many in one shed; good ventilation at the top; no draughts:—These are my precautions."

Nearer London still the management is almost exactly that of the London cowhouses. Mr. Sumpton tells me that he feeds his cows at his farm in Hendon parish exactly as he does his cows in Little Warner Street, only beginning an hour earlier, so as to give time to bring the milk in. No attempt is made to cool it for transmission this short journey; but it arrives warm an hour after milking, sometimes, however, the worse in summer time for even so short an interval.

Mr. Panter, who manages Lord Granville's large dairy-farm

at Golder's Green, upon the Finchley Road, thus described the management of his cows, in evidence before the Royal Commissioners on the Cattle Plague:

"We give about a bushel and a quarter, or from that to a bushel and half of brewers' grains to each cow, and about 15 lbs. of hay, and about 30 lbs. of mangold wurzel, with 4 lbs. of meal (pea-meal principally), in addition to that feed in winter. In the summer, grass is given instead of hay and mangold wurzel. This mode of feeding, though it damages the constitution of a cow, is adopted in order to force the greatest quantity of milk which the dairyman can get. The gain more than covers all the loss; at least it is supposed to do so. In our suburban district we give them more air, and feed them more on grass in the fields. We do not feed them so heavily upon grains and artificial food as they do in London. We give them much more natural food. Some turn them out from about July to October; and some do not. The cows always lose condition by being turned out; that is invariably the case. They lose milk, too, to the extent of a quart a day, unless the pasture is very good indeed."

It is plain that the London cow management for milk production is certain to be followed wherever it can, if cows lose both flesh and milk when turned out to grass. Mr. Balls, who manages the dairy farm at Oakington, near Sudbury, in the occupation of Col. the Hon. W. P. Talbot, has kept from eighty to 100 cows constantly in stalls. They are milked at 3 a.m. and 4 a.m., and again at 1 p.m. and 2 p.m., and are fed exactly on the London plan, first on grains, a bushel between two, next with a little hay, then with a bushel of either cabbages or mangolds, and then again a little hay; in the afternoon grains and hay and water (they are only watered once a day), and again hay before night. The alteration in summer is a substitution of grass for hay and mangolds. A small quantity (3 lbs. or 4 lbs. a day) of meal is given along with grains in the case of cows nearly dry; or rather this used to be given, for Mr. Balls now declares that there is no profit in the attempt to put on extra flesh with extra feeding, so long as meal is so dear and meat so cheap. He contrives, however, by careful purchasing to get cows which will put on flesh without extra feeding as they get dry.

At Lodge Farm, Barking, where several cowhouses holding sixty cows apiece have been built at intervals of 200 or 300 yards from one another, in the midst of fifty acres of land, which is being irrigated with North London sewage, and has been thus producing enormous crops of Italian rye-grass, the rule of London management has been till lately carefully followed. A bushel of grains between two cows has been given immediately after milking, and followed by a little hay (a truss amongst ten or twelve cows). They were then

watered freely, and afterwards 30 lbs. or 40 lbs. of pulped mangolds, mixed with hay chaff, were given, and the cows were left. The treatment in the evening was exactly the same, except that a little hay was given when they were bedded up for the night. In this case distillers' grains were used; and whenever the supply failed us the milk ran short at once. The yield dropped one fifth, sometimes one fourth, at the very next milking after the missing meal of grains, and brewers' grains were a very inefficient substitute for them. The quantity of milk would, however, gradually increase again under other feeding, as soon as the cows had taken cordially to the new ration, whatever it was; but in no case did it ever amount to the quantity which was quoted when they received their fill of distillers' grains. Latterly, partly owing to the cost and difficulty of obtaining these grains, and partly because it was desirable to test the value as cow-food of sewage-grown Italian rye-grass given by itself, the mode of feeding has been altered. Several cow-houses were supplied with grass alone during the past summer, receiving nothing else whatever, and about $1\frac{1}{2}$ cwt. a day was the average consumption per cow; and though the substitution of a bushel of grains for $\frac{1}{2}$ cwt. of grass was at once followed by an increased yield of milk, yet the latter was so much the dearer food that the balance of profit was against it as long as grass was not valued at more than 18*s.* a ton upon the land. In winter we are giving mangolds, hay, and meal, without grains. In one shed at present twenty-five cows, nearly dry, are receiving 16 cwt. of mangolds, 7 trusses of hay, 100 lbs. of barleymeal, and 80 lbs. of cake, which is 70 lbs. of mangolds, 8 lbs. of hay (these are given as chaff and pulp), 4 lbs. of barleymeal, and about 3 lbs. of cake per fatting cow. In another shed, where fifty-eight are being fed, seventeen of which are freshly calved cows, and the rest are in about half milk, the consumption is 2 tons of mangolds, 12 trusses of hay, 7 trusses of straw (all chaffed and pulped and mixed), 56 lbs. of meal, and 36 lbs. of cake. This amounts to about 80 lbs. of mangolds and 16 lbs. of mixed hay and straw (with 3 lbs. or 4 lbs. of meal and cake to a few of those most nearly dry or in heaviest milk). The seventeen cows in full milk get 13 lbs. of hay, 76 lbs. of mangolds, 2 lbs. of meal, and 2 lbs. of cake apiece, costing at current prices rather under 2*s.* apiece. They gave at first on the average 2 barn gallons (= 16 quarts) apiece, which are worth, delivered in London, 3*s.* 4*d.*

I add here, from the paper on this subject read before the Society of Arts, a table giving the daily winter rations of a

cow in thirteen cowhouses, of which the owners were good enough to describe to me the management:

No.	Cows milked.	Daily winter ration of a cow.				
		Grains.	Hay.	Distillery wash.	Mangolds.	Meal or cake.
	No.	Bushels.	lbs.	Gallons.	lbs.	lbs.
1	108	1½	15	...	30	3 (F)
2	40	1	14	...	40	2 (F)
3	68	1	?	...	42	?
4	10	1½	12	...	60	2 (F)
5	100	¾	9	...	56	3
6	20	1	6	...	56	3
7	?	1	14	...	28	Pint of condiment.
8	50	1	12	...	28	Peck of bran.
9	?	1½	9	...	28	Pint of meal.
10	?	1½	15	...	30	?
11	50	1	14	...	25	5
12	?	1½	7	...	60	4
13	?	1½	11	6	42	3

The letter F intimates that the meal or cake was given only to fatting cows. It will be seen that in only one house was distillery wash given; and I believe that though productive of a great quantity of poor milk, it is not by any means a common article of food in London dairies. Its reputation as a washy food may, however, have hindered my being told of its use. There is nothing, I believe, that more excites the milk secretion, and, when given fresh along with other substantial food, no objection can be made to its use.*

In only one other particular does town dairying differ from that of country farms. No attempt is made to breed from the cow. It is very rarely indeed that a bull is kept, or that the cow receives one in a London cowhouse. She is kept till the quantity of her milk no longer pays, and she is then sold. In the country, on the other hand, it is of course generally the policy of the farmer to keep on his better cows for several seasons, and to breed from them. But the management in that case in no respect differs from that of ordinary dairy farms, which is not my subject; and even as regards suburban dairies this, perhaps, more properly comes

* It is, however, objected to the use of distillery wash, and in a less degree to that of grains, that the milk derived from their use as a food needs to be consumed at once, as it will "turn" more rapidly than the milk of grass-fed cows. I know of no direct experiment on this point, and can only refer to the impression which some milk-dealers have that this is so.

under the third section of my subject—the general treatment of the cow.

Treatment of the Cow.

In so far as the feeding of the cow belongs to this part of the general subject of town dairies—and, of course, it is the most important part of it—the only remark that need be made after what has been already said is that the food must be always good of its kind, and regularly and punctually given. Faulty food soon shows itself in the quality of the milk; and irregularity in feeding, or any other disturbance of so sensitive a creature as a milch cow, is sure to be followed by a diminished yield of milk. Swedes and common turnips taint the milk; and, if given at all, should be used either in small quantity with other food, or, what is better, cooked in a hot mash.* I have given cabbages for months together to upwards of 100 cows, without any particular care being taken to keep spoiled or rotten leaves out of the manger; but I have never found the milk tainted by them. To steam food which has any aroma belonging to it communicable to the milk is, of course, as already said, the best way to make it harmless. But though I have been over sixty London and suburban cowhouses, I know of none where cow food is steamed or cooked, excepting only Mr. Dancock's shed at Brompton, and there the steaming goes merely to the manufacture of a gruel to be thrown over an uncooked food, as hay, chaff, or grains. It is nevertheless certain that steaming food, wherever labour is not very costly, or where the existing hands have time to spare for the purpose, without interfering with their efficiency elsewhere, improves its nutriveness, and may be confidently recommended.

A correspondent of the *Agricultural Gazette* some years ago thus described his management of cows in winter time. He said—

"I have a boiler containing about forty gallons, and into it I put about 50 lbs. of turnips, a considerable quantity of water, and about 12 lbs. of straw cut into chaff, and this is boiled for about two hours, when it becomes a dark nasty looking mass; one half of this is taken out into two tubs, and whilst warm 1½ lb. of bean or pea-meal is stirred into each, and then given to each cow at about 110° of heat. That which is left in the boiler remains till morning, and if well covered up is still warm enough for use; it is then mixed with the pea or bean meal as before, and given to the cows at break of day; this, with hay *quantum suff.*, constitutes their daily diet; and I get

* Here, too, attempts are made, by using saltpetre in the water with which the cans are washed, and by putting a little in with the milk itself when they are filled, to get rid of any taint which it may possess.

about 6¼ lbs. of butter weekly from each cow. The butter produced in this way has no taste of turnips; and the avidity with which the cows eat this boiled mass is a good criterion of its value. When given to the cows it should be thin and sloppy."

Mr. Horsfall's management, as regards steamed food for cows, already described in this Journal, is no doubt fresh in the memory of our readers.

"He gave his dairy cows rape-cake, of the kind termed 'green' cake, which imparted to the butter a finer flavour than any other kind of cake; and in order to induce them to eat it, he blended it with one quarter the quantity of malt-dust, one quarter bran, and twice the quantity of a mixture in equal proportions of bean straw, oat straw, and oat shells; all well mixed up together, moistened, and steamed for one hour. This steamed food had a very fragrant odour, and was much relished by the cattle; it was given warm three times a day, at the rate of about 7 lbs. to each cow (or 21 lbs. daily). Bean meal was also scattered dry over the steamed food, cows in full milk getting 2 lbs. per day, the others but little. He found this substance to be an unfailing means of keeping up the condition of cows while giving milk. When the animal had eaten up this steamed food and bean meal, they were each supplied daily with 28 to 35 lbs. of cabbage from October to December, of kohl-rabi till February, or of mangolds till grass time; each cow having given to her, after each of the three feedings, 4 lbs. of meadow hay (or 12 lbs. daily). The roots were not cut, but given whole. The animals were twice a day allowed to drink as much water as they desired. After the date of his original report, Mr. Horsfall discontinued the use of bean-meal, owing to its comparative price, and gave in its place, along with about 5 lbs. of rape-cake, an additional allowance of malt combes, and 2 or 3 lbs. of Indian corn-meal per cow. On this food, in instances actually observed, his cows gave fourteen quarts of milk a day, at the same time that they gained flesh at the rate of about ¼ cwt. per month."

These instances, however, of the use of steamed food in country experience are, perhaps, the less likely to induce any alteration in town cowhouses, from the fact that there a large portion of the dairy food, viz. brewers' and distillers' grains, has already gone through a cooking process.

But the thing, of all others, so far as my experience has gone, which is most important in order to the sweetness of the milk, is that the water given to the cows be clean and good. In one of the Lodge Farm cowhouses the tank sunk for the reception of grains, large enough to hold two or three days' supply when firmly trodden into it, had not been built water-tight, and the leakage of stale grains escaped and tainted the well, at some little distance (in a gravel subsoil), from which the cows were watered, and the milk of several milkings was utterly spoiled before the cause of the mischief was discovered. It arrived in town during two or three days stinking of foul grains, and there is not a more offensive smell. The foul water given to the cows was, I believe, the sole cause of the misfortune, for it ceased soon after pure

water was supplied. Good food and water, regularly given, are thus essential parts of successful cow-keeping. It should be added here that the proportion of soft and succulent dry food should be regulated with regard to the condition of the dung. If a cow becomes at all costive she loses milk at once. The dung ought to be rather loose than otherwise, in order to keep her in good productive condition. I need hardly say that quiet and gentle treatment of the cow is also an important point; and an ample interval of absolute rest between feeding and milking, during which the less she is disturbed the better, contributes materially to her productiveness at the pail.

One of the things which most strikes a stranger who first enters a London cowhouse during winter is the warmth in which the cows are kept. Experience has proved that this, too, has an important influence on their productiveness. They stand very thickly on the ground—one to every thirty to thirty-six square feet; the windows are closed and matted, and no thorough draught allowed; and thus the shed is warmed. There is generally room enough overhead, and perhaps a tiled roof, which allows ample ventilation; and thus, where the shed is kept tolerably clean, the air is sweet enough, as well as warm.

Very little litter or other bedding is used. I have been over large suburban cowsheds where none whatever is used. The cows stand so close to each other that they cannot get across, and thus the dung and urine fall from them into the gutter behind them, from which it is cleared twice or thrice a day, and the lair—an earthen floor—is thus kept dry. At the Lodge Farm we have used sawdust. At present 8 cwt. is the daily allowance in two sheds containing eighty-five cows; and there were exactly twenty-one tons of dung removed from these two sheds last week, being 3 tons daily. Most of the urine runs into a tank, only a portion of it being retained in the litter that is used. Two or three bushels of sawdust are, in the first place, put under every cow, and thereafter one bushel daily is sufficient, as much being daily taken as fast as it gets soiled. The quantities amount to about 11 lbs. per cow added, and 80 lbs. of dung per cow taken; so that we collect about 70 lbs. per diem of the actual fæces of the animal. I may on this refer to a letter received twelve years ago from Mr. Telfer, of the Canning Park Farm, near Ayr, who kept forty-eight of the small Ayrshire cows for a butter dairy. He found that these cows yielded 60 lbs. of dung and 18 lbs. of urine every twenty-four hours. Taking their smaller size into account, this agrees very fairly with

our experience at Lodge Farm. He adds that the cows yielding most milk at the same time yielded the most dung and urine, which is not surprising, seeing that these are, in fact, the *débris* of a manufacture, and must be greater or less according to the quantity of raw material which passes through the machine. Mr. Telfer's cows lay on a cocoa-nut matting, their dung and urine falling into an accurately made gutter, which was cleaned out perfectly by a single draw of a drag made to fit the groove. In London cow-houses the rough causewayed floors are cleaned out with besom and spade into a dung-pit, which the sanitary inspector requires to be emptied at intervals; and the gutters in well-managed houses are washed down from the pail.

The Cowhouse.

The mode in which the cattle are housed is an important part of their treatment.

As regards the existing cowhouses, I cannot do better than quote, in an abridged form, the description given of them in the paper read before the Society of Arts:

"A London cowhouse may be, and often is, a piece of ill-conditioned, rather ricketty old stabling, with a sort of brick-built manger on the floor, the length divided by short and scanty stall divisions, seven feet or seven and a half feet apart, furnished with ropes, or straps, or chains, with running rings, so as to tie up two cows between each pair. This floor is roughly causewayed, and there is a gutter lengthwise down it, parallel with the manger, and a little more than a cow's length from it. The house may be only wide enough for a single row of cows, or there may be one on either side, with the gutter between them for the drainage of both. I am now referring to the average style of the smaller and inferior cowhouses in the city, and in the poorer districts of the metropolis. The roof is either low, with plenty of ventilation through its loosely lying tiles, or if higher, there is a 'tallet' or floor overhead, where hay and other food are placed, and in which wide spaces are left next the walls and over the heads of the cattle, and then the space of this upper room is measured into the 1000 cubic feet per cow, which is the rule that must be observed (for instance, in St. Pancras) if the cowkeeper wishes to avoid being opposed for a renewal of his license. There are window places, which at winter time are closed, perhaps, with a bit of sacking nailed over them.

"It is either a clean and tidy place, where both the cowmen and their stock are clean and dry and comfortable, everything in its place, the animals all lying down, having comfortably fed, and the air with no other perceptible smell than that of the chloride which the careful owner sprinkles once or twice a day along the gutter—*or*, it is a filthy hole. In general the accommodation—limited as it is—is quite apart from the dwelling-house, but there are exceptions even to this.—Such is the smaller but most numerous sort of London cowhouse.

"Go a step higher, and you come upon a class of men many of them also occupying small farms near town, all of them employing very considerable capital. They keep thirty, fifty, eighty, or more cows apiece, and these are lodged either in larger establishments of the kind already described—not unfrequently ram-shackle old buildings with yards attached, either with

double-roofed cowhouses, or covering a square, sometimes with a floor overhead, and at others open to the roof, where the cows are arranged, first around the walls, and then in a square block, head to head, in the middle. Sometimes there are parallel rows of roofing together, and double rows of stalls under each. And here, too, there is the same variety of management as to cleanliness and order. I could point out some samples even of this higher class which are unquestionable nuisances, and others as clean and sweet as a parlour; for in this middle class of cowhouses, as they may be called, there are examples of the very best style of accommodation.

"Take, for example, Mr. Dancock's dairy already named; you enter through a wide gateway passage roofed with glass, covered with vine-leaf and sometimes grapes, leading you to a well-kept yard, with clean and comfortable cowshed on one side, and stabling, hay-house, and food-store, on the other, and an inner cowhouse further on. Elsewhere, still in Chelsea, you may enter a larger yard in a poorer neighbourhood, and find shedding closed against the winter, providing as good accommodation, in single rows, for as good a herd of dairy cows as I ever saw—cleanliness and order being apparent everywhere. Or you may pass from a well-kept mews into a lofty, clean, and, though ceiled, well-ventilated and well-drained apartment, at least twelve feet high, with, I should suppose, sixty square feet of standing ground to every beast—warm, well-watered, and well fed."

(*To be continued.*)

Translations and Reviews of Continental Veterinary Journals.

By W. Ernes, M.R.C.V.S., London.

AN ESSAY ON THE SUPPLY OF BLOOD TO, AND THE FUNCTIONS OF, THE SPLEEN, THYROID GLAND, AND SUPRA-RENAL CAPSULES.

Presented to the Royal Academy of Medicine of Belgium by Dr. Fossion, Honorary Member of the Academy, &c.

(*Continued from* p. 460.)

Structure of the derivative (diverting) organs.—Physiologists have always attached great importance to the knowledge of the histologic elements of the organs of derivation; they have even gone so far as to suppose that this knowledge would be the means of discovering their function. Notwithstanding, however, the great amount of labour which has been given to, and the many works which have appeared on, the subject, they have not been able to recognise it in the chaos of hypotheses they have produced on the organs in question.

We shall endeavour to examine succinctly the results of the researches undertaken on this subject, and afterwards to draw the conclusions which logically can be deduced from them.

The spleen is a parenchymatous organ covered with a thin fibrous envelope, semi-transparent and of great power

of resistance. This tissue is composed of connective and elastic fibres, and in some animals, as in the dog and the cat, there are also smooth muscular fibres. In some parts the membrane is reflected inwards and envelopes the blood-vessels and forms a solid covering to them. All the divisions of the splenic artery which penetrate the parenchyma of the spleen are thus enveloped with a fibrous sheath; the fibres, by their extension and division, form the *trabeculæ* of the spleen. From the inferior surface of the membrane of this organ are given off a multitude of fibres which, with those from the sheath of the arteries, form the *trabecular* woof of the spleen. The fibres which constitute the *trabeculæ* in question have irregular spaces between them, which are designated the cells of the spleen; altogether these structures form a sort of cavernous tissue analogous to that of the penis.

In the openings or cells of the spleen is deposited the splenic pulp; no special envelope is found on these cells; the pulp of the spleen is thus in immediate contact with the *trabeculæ* and the sheath of the blood-vessels.

There are also found in these cells small bodies designated by the name of the corpuscles of Malpighi. Their diameter, in general, is about half a millimeter, their distance from one another is from one to two millimeters; they are attached to the parietes of the arteries, and are composed of a fibrous membrane, externally of a thin loose texture; their cavity is filled with a liquid, in which floats cells and nuclei of cells.

This is the short summary of the structure of the spleen in the majority of animals.

It has been attempted to make the corpuscles of Malpighi play a most important part, so far as considering them the sole active glandular elements of the spleen. All the parenchyma of this organ, according to this opinion, would only be subsidiary to the small bodies in question.

We cannot share this opinion. It is a known fact that the corpuscles of Malpighi are very inconsiderable in many animals, and are totally absent in others. From the researches of Kölliker they are not found in the batrachia and in many of the fishes.

Leydig remarks that in some of the mammalia the white substance of the spleen is not constantly conglomerated. In certain fishes, the sturgeon for instance, the white substance of the corpuscles is disseminated in the parietes of the arteries, and forms at certain distances from each other spheric enlargements. The contents of the corpuscles are not different from the splenic pulp.

The pulp is composed of globules similar to those found in the cavity of the corpusculi Malpighii, with débris of red globules, of pigment, and cells one fortieth of a millimeter. Kölliker considers them to be the nuclei of blood-globules in the progress of destruction.

The arteries of the spleen are divided and distributed each in separate compartments, of which Sappey fixes the number from eight to ten. Their terminal disposition is *penicillated* (*pénicillée*, French) in the mammalia; but in the Ophidians and the Chelonians the capillaries form a plexus or network.

The splenic vein is of considerable calibre; in man its trunk is in extent five times as big as the artery. Schmidt estimates the capacity of its branches at twenty times the capacity of the corresponding arteries. It has been found in numerous researches that the splenic vein in the horse and pig, &c., commences in the substance of the spleen by a meatus deprived of proper parietes, and that it is only provided with them in the large trunks.

The thyroid gland is enveloped in a fibrous membrane, from which are given off a multitude of elongations dividing the organ into many small compartments, in which are located the vesicles or lobules of which the gland is composed. The office of these prolongations seems to be to conduct the ramifications of the artery to the external surface of the vesicles. These prolongations are, as one may see, the *trabeculæ* analogous to those which form the skeleton of the spleen; like them they are formed of a fibrous tissue mixed with elastic fibres. The interstices, between which are the *trabeculæ*, are filled with the proper vesicles of the organ.

These are filled with a more or less viscid fluid. They are grouped round a considerable branch of the artery, which detaches to each follicle a small branch, which divides itself into capillaries and covers the vesicle with a vascular network.

The veins of the thyroid gland are considerably larger in calibre than the arteries.

As to the lymphatics, they are very numerous in proportion to the blood-vessels; they emanate from the substance of the gland, but they do not penetrate to the interior, as is the case in the conglomerate glands.

The thymus gland is, like the lungs, composed of two unequal lobes, which, though united in appearance, are distinct, their connection being only formed by a longitudinal peduncle, more or less spiral.

The substance of the thymus is traversed by a network of

trabeculæ, which gives it the aspect of a corpus cavernosum. The cavities between them form packets of various sizes; they communicate with one another, also with a larger cavity which occupies the centre or axis of the peduncle.

These cavities are interiorly invested with granules, which seem to constitute the proper substance of the organ. These granules are composed of cells and nuclei, in the midst of which the blood-vessels ramify.

The supra-renal capsules are situated on the superior part of the kidneys, to which they form a sort of hood. In the embryo these bodies are much larger than the kidneys, but the latter increase rapidly towards the end of the embryonic life, in such a manner that at the birth they are three times the size of the capsules. In the adult they only represent the twenty-fourth part of the size of the kidneys.

Like all the other organs in question, the supra-renal capsules are covered exteriorly by a thin membrane of connective tissue; from this membrane emanate fibrous filaments which penetrate into the cortical and medullary substance, and divide the parenchyma of the organ into a multitude of small alveoli, each of which contains a vesicle, the cavity of which is filled with granules of an albuminoid, fatty, and pigmentous character. In the medullary substance are found numerous nervous fibres interlaced with each other. As is seen by this succinct account of the elements which constitute the supra-renal capsules, there is here, as in the spleen and the other organs which serve for the diversion of the blood, a skeleton of *trabeculæ* destined to support the blood-vessels, and it is very probable that the vesicles in the interstices left between the *trabeculæ* only secrete a liquid which is of no importance, similar to the fatty matter in the adipose cells.

We have now described the anatomy of the organs of derivation, such as has been given by anatomists of high authority. Huschke and Kölliker are agreed in recognising in all these organs—1st, a skeleton of *trabeculæ* serving to support the blood-vessels; 2nd, vesicular cavities occupying the interstices between the *trabeculæ;* 3rd, the presence of a fluid in the cavities containing globules.

Neither of them assigns any outlet for this fluid, except the lymphatics, and principally the veins. What is there in the structure, I would ask, of these organs of derivation to imply the notion of a secretion appropriated either to the perfecting of the blood or the lymph? Where is the creative element of the globules of the blood to be found? Have globules of blood in their course of formation ever been found in the

pulp of the spleen, or in any other part? Might it not be maintained, on the contrary, that the pulp of the spleen is definitively formed by the elements of the blood, which, by their long sojourn in the spleen, have become altered, and the red globules, becoming disintegrated, are possibly in part transformed into white globules.

The structure of the organs of derivation is wonderfully appropriated for the diverting of the blood. There are a great number of vessels which divert a large quantity of blood, which is nowise in proportion to the small quantity of fluid which is found in the vesicles of the thyroid gland and the supra-renal capsules, &c.

If microscopists had conducted their researches in a different spirit from that which has guided them up to the present time, they would, perhaps, have found in the disposition of the blood-vessels proofs that they have no other functions than to transmit the blood through these organs, and they would then have considered the fluid which is found in the vesicles of the thyroid and the thymus glands as necessary products passing by exosmosis from the cavity of the vessels into reservoirs; moreover, one would be greatly deceived in supposing that the knowledge of the histologic elements constituting any organ whatever could lead to the knowledge of its function. I am far from denying the importance of microscopic researches; but I am of opinion that they only serve to illustrate details of a function already known. This is the circle in which the science could be most usefully moved, but beyond which it is liable to lead to the forming of hypotheses which are not borne out by proofs and observation of the great facts in nature. The organs of derivation have no direct relations with the external world; they are never in the exercise of their function in connection with external agents. It is impossible to determine why the elements of their structure are disposed of in this manner rather than any other. The reason not being patent, the knowledge of the elements cannot lead to that of their function. There is, however, an anatomical peculiarity in the organ which might have led observers not to consider it as a true gland. The labours of Goodsir on the secretory cells have demonstrated that these bodies are separated from the plastic fluid by an amorphous membrane, which serves them as a support. On the contrary, in the organs of derivation, the cells of which they are formed are in direct contact with the nutritious fluid.

This anatomical disposition is the indication of an individualisation of the secretory cells, of the glands proper.

It proves that they are employed in a special elaboration. Nothing similar can be alleged in respect to the cells of the organs of derivation. One may even be authorised by this to believe that they are of no special use.

(*To be continued.*)

ROYAL COLLEGE OF VETERINARY SURGEONS.

QUARTERLY MEETING OF THE COUNCIL, HELD JULY 8TH, 1868.

PRESENT:—The President, Professors Simonds, Brown, and Assistant-Professor Pritchard; Messrs. J. C. Broad, Cartwright, Fleming, Harpley, Harrison, Hunting, Lawson, Moon, Pritchard, Wilkinson, Withers, and the Secretary.

The President in the Chair.

The minutes of the preceding meeting were read and confirmed.

Letters were read from Professors Williams, M'Call, and Brown, acknowledging the honour of their election as Vice-Presidents.

A letter was read from Mr. G. Fleming, of the Royal Engineer Train, stating his wish to present to the museum of the College an impression taken from an ancient brass seal found near Darlington, and supposed to belong to the period between the twelfth and fourteenth centuries. A small work entitled, 'The Horse: how to Feed Him,' by Professor Armatage. The horns of an Ayrshire cow and Irish goat, presented by the same gentleman to the library and museum, were also laid upon the table.

It was moved by *Mr. Wilkinson,* and seconded by *Professor Simonds*—

"That a vote of thanks be given to the above-named gentlemen for their kind presentations, and that the Secretary select a suitable mounting for the seal presented by Mr. Fleming."—Carried.

The election of a member of the Court of Examiners, to fill the vacancy caused by the death of the late Professor Morton, was then proceeded with.

It was moved by *Mr. Wilkinson,* and seconded by *Professor Simonds*—

"That Professor Brown, who had held office for many years as a teacher of veterinary science in the Royal Agricultural

College, and who among other works had published one on therapeutics, be elected to fill the vacancy caused by the death of Professor Morton."

On the ballot being taken, Professor Brown was declared to be unanimously elected.

Prof. Brown returned thanks for the honour of his election.

The election of a Registrar was next proceeded with.

It was moved by *Mr. Fleming*, and seconded by *Mr. Hunting*—"That Mr. Coates be re-elected Registrar."

On the ballot being taken, Mr. Coates was declared to be unanimously elected.

Mr. Coates, as Registrar for the past year, then presented his report of the new members which had been added to the College, and of those which had been removed by death* since the last meeting of the Council.

With reference to the admission of new members, the report set forth "that at the several meetings of the Court of Examiners, held in London, fifty-eight pupils of the Royal Veterinary College had been admitted members of the body corporate, and sixteen rejected. Three members from the Albert Veterinary College also passed their examination. Sixteen members were admitted from the Edinburgh Veterinary College, and six from the Glasgow Veterinary College, five being rejected.

"That at a special examination held in Edinburgh two candidates, holding the Highland and Agricultural Society's certificate, were admitted members of the body corporate, and one was admitted by a written examination."

The names of the new members were read, and also those who were rejected; likewise the names of the examiners and *ex officio* members of the Court who were present at the several examinations.

Letters were read from Mr. Alexander Strachan, of Methled, Aberdeenshire, enclosing a certificate from the late Professor Dick of having attended two sessional courses at the Edinburgh Veterinary College, and requesting that he might be allowed to have a written examination.

The Secretary was instructed to inform Mr. Strachan that his application for a written examination was not admissible, but that he might present himself before the London Board of Examiners in December next, or in Edinburgh in the ensuing year at the usual meeting of the Court of Examiners.

A proof copy of the new Register was laid upon the table, duplicate copies of the same having been previously submitted to the Registration Committee for their approval.

* See Obituary, page 592.

After a considerable discussion on the subject of the county list, and the gratuitous issue of the Register,

It was moved by *Mr. Wilkinson,* and seconded by *Professor Simonds*—

"That the new Register be not issued until the whole question of its future publication and correct insertions of new members be reported upon by the Registration Committee."—Carried.

The following gentlemen were nominated on the Registration Committee, viz. Professors Simonds, Brown, and Pritchard; Messrs. Ernes, Harpley, Harrison, Moon, and Wilkinson.

The Finance Committee reported that they had examined the vouchers and receipts of payments during the preceding quarter, and found them correct. The quarterly balance-sheet of the Treasurer's account was then read. The current expenses amounted to £77 12*s.* 2*d.*, which the Committee recommended should be discharged. This would leave a balance in hand of £866 17*s.* 4*d.*

It was moved by *Professor Simonds,* and seconded by *Professor Brown*—

"That the following gentlemen constitute the Finance Committee, viz. Messrs. J. C. Broad, Field, Harpley, Harrison, Moon, and Wilkinson."—Carried.

A question was raised with reference to the deposit account and the low rate of interest allowed by the bankers, and whether it would not be desirable to purchase stock in the Three per Cent. Consols.

It was moved by *Professor Simonds,* and seconded by *Mr. Lawson*—

"That £500 Stock be purchased in the names of trustees, and that the Secretary consult the legal adviser of the College as to how the matter should be carried out, and also with reference to the appointment of trustees."—Carried.

The following gentlemen were nominated for the House Committee, viz. Professor Spooner, Messrs. Harpley, Harrison, and Withers.

The Secretary was requested to send notices to all the Committees, so as to have their reports ready for the quarterly meeting.

A letter from Mr. Job Cooper, of Market Weighton, was also read, requesting the opinion of the Council with reference to Mr, Thomas White, Veterinary. Surgeon, of Llangar, who held certain parochial offices besides practising his profession, and suggesting whether his name should be retained on the Register.

The Secretary was requested to inform Mr. Cooper that this was a subject of which the Council could take no cognizance.

Letters were read from Dr. Dunsmure, Hon. Secretary to the Board of Examiners, on the subject of the late examinations held in Edinburgh. A question was asked with regard to Mr. Hammond, who had been a rejected candidate on a former occasion, but who had presented himself before the special Board, and passed his examination, as to whether he would be required to pay an extra fee.

The Council resolved—"That as Mr. Hammond held the Highland and Agricultural Society's certificate, the additional fee should not be demanded."

A letter of considerable length from Mr. Muston, of Kelso, Roxburghshire, on the subject of the Scotch Charter, was then read.

The Secretary was instructed to acknowledge the receipt of the letter.

After reading of the correspondence,

It was moved by *Professor Brown,* and seconded by *Professor Simonds*—

"That for the future, the Secretary make a *précis* of all letters which he receives, for the information of the Council."—Carried.

The subject of granting separate certificates to the students by the Principal of the Edinburgh Veterinary College was next considered, when

It was moved by *Mr. Lawson,* and seconded by *Mr. Wilkinson*—

"That the question of the granting of certificates by the Principal of the Edinburgh Veterinary College be left for future consideration."—Carried.

The appointment of the Parliamentary Committee then took place.

It was moved by *Mr. Wilkinson,* and seconded by *Mr. Harrison*—

"That the Parliamentary Committee should consist of the same gentlemen as last year, with the exception of Professor Varnell and Mr. Cowie, who had ceased to be members of the Council."—Carried.

The President then read an extract from the *Scotsman,* setting forth that Her Majesty's Government had officially communicated to the Highland and Agricultural Society their refusal to grant a new veterinary charter for Scotland.

It was moved by *Mr. Harpley,* and seconded by *Mr. Wilkinson*—

"That the President be empowered to write to the Clerk of the Council, requesting that he would be kind enough to furnish the Council of the Royal College of Veterinary Surgeons with a copy of the letter in which he states that the application for a separate charter for Scotland could not be entertained."—Carried.

By order of the Council,
WILLIAM HENRY COATES,
Secretary.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

MONTHLY COUNCIL, WEDNESDAY, JULY 1ST.

PRESENT:—the Duke of Richmond, K.G., President, in the chair; the Earl of Powis, Lord Bridport, Lord Chesham, Lord Kesteven, Lord Portman, Lord Tredegar, Lord Vernon, Lord Walsingham, Sir Massey Lopes, Bart., M.P.; Sir A. K. Macdonald, Bart.; Sir T. Western, Bart.; Sir Watkin W. Wynn, Bart., M.P.; Mr. Amos, Mr. Barnett, Mr. Cantrell, Colonel Challoner, Mr. Brandreth Gibbs, Mr. Hornsby, Mr. Jonas, Colonel Kingscote, M.P., Mr. Milward, Mr. Pain, Mr. Randell, Mr. Ransome, Mr. Read, M.P., Mr. Rigden, Mr. Sanday, Mr. Shuttleworth, Mr. Stone, Mr. Thompson, Mr. Torr, Mr. Turner, Mr. Webb, Mr. Wells, Mr. Jacob Wilson, Professor Simonds, and Dr. Voelcker.

FINANCES.—*Major-General Lord Bridport*, chairman, presented the report, from which it appeared that the Secretary's receipts during the past month had been duly examined by the Committee, and by Messrs. Quilter, Ball, and Co., the Society's accountants, and found correct. The balance in the hands of the bankers on the 30th June was £1340 9*s.* 9*d.*, and £2000 remains on deposit. The quarterly statement of subscriptions and arrears to 30th June, and the quarterly cash account, were laid on the table.

JOURNAL.—*Mr. Thompson*, chairman, reported the recommendation of the Committee, that, as the appointment of a new editor cannot be made for some months, the Committee be authorised to make arrangements with Mr. Goodwin to continue his services, and prepare the matter for the February number of the *Journal*

PRIZE ESSAY.—*Mr. Thompson* having announced the award of the judges, and the motto-paper having been opened by the President, the successful competitor for the prize of £20 in Class X, "Rise and Progress of the Leicester Sheep," was declared to be Mr. H. H. Dixon, of 10, Kensington Square, W.

EDITORSHIP.—*The President* read the following Report:

"The following letter from the Secretary was read and considered by the Committee:

" 'My Lord Duke,—Having served the Society for nine years, and those perhaps the best of my life, I was somewhat astonished

at the terms into which Mr. Randell's resolution was altered, and the large majority by which it was carried, and trust you will allow me to offer some remarks to the Committee appointed to carry out the decision at which the Council arrived. Had the original idea of this resolution been followed up, I should have gladly proposed my services in editing the *Journal*, and am very willing to do so now with the assistance of a sub-editor, to be approved by the Council. The bond now before you, under which I hold my office, distinctly points out my duties as Secretary; and, at the time of my appointment, I stated to the Council my ignorance of practical farming. These duties I have fulfilled to the utmost of my power, and I trust in a manner calculated to promote the material interests of the Society,* as is indeed proved by the fact that your funded capital, which at the date of my appointment (December, 1859) stood at £10,000, has in that interim been raised to £21,027 19*s.* 6*d.*; while the arrears of subscriptions, which I then found to be £4804, are now £646. The annual fluctuation in the number of members is not greater than may be expected in a society of this magnitude, as was pointed out by Mr. Thompson at the last general meeting; while the influence of the losses occasioned to the farmer by the cattle-plague, and to the Society by the consequent suspension of the cattle show for two years, must be borne in mind. This temporary diminution of numbers will, however, be more than counterbalanced by the meetings at Leicester and Manchester. It will be with the deepest regret I shall quit the service of the Society; but should the Report of the Committee recommend my removal from the secretaryship, I shall be glad of as long notice as practicable, time being all important to me in seeking other employment, which, at my age, I fear, I shall have much difficulty in obtaining.—I have the honour to be, my lord duke, your Grace's most obedient servant,

" ' H. Hall Dare, *Secretary*.

" ' His Grace the Duke of Richmond, K.G.,
President of the Royal Agricultural Society of England.'

" The Committee are of opinion that it is inexpedient to accept the offer made by Mr. Hall Dare to act as editor of the *Journal* with the assistance of a sub-editor. Should the foregoing recommendation be approved by the Council, Mr. Hall Dare's engagement with the Society will terminate on the 1st of January, 1869,

* Statement of the Society's Property.

	December, 1859.			June, 1868.		
	£	*s.*	*d.*	£	*s.*	*d.*
New Three per Cents.	10,000	0	0	16,027	19	6
Cash at bankers'	1,339	8	0	3,508	2	4
Petty cash	3	4	4	46	10	1
On deposit				2,000	0	0
Showyard plant				2,800	0	0
Books and furniture	2,000	0	0	2,000	0	0
	£13,342	12	4	£26,382	11	11

and the Committee recommend that formal notice shall be given him to that effect, and that he be presented with a year's salary (£400) on leaving the Society's service. The Committee recommend that an advertisement be issued, inviting applications for the combined office of Secretary and Editor, at a salary of £600 per annum. The advertisement to be issued forthwith. No application to be received later than the 20th of October."

The reception of the Report having been moved by Mr. Torr, thirteen votes were given in its favour and fourteen against it. Mr. Thompson desiring to take the propositions *seriatim*, the President decided that the Report, having been negatived as a whole, could not be discussed *seriatim*.

Mr. Jonas having inquired if the resolution of the Council combining the offices of Secretary and Editor remained in force, Lord Portman explained that the resolution remained until rescinded on regular motion. It was then moved by Lord Walsingham, and seconded by Col. Challoner, that the offer contained in Mr. Hall Dare's letter be accepted. The Earl of Powis opposed the combination of the two offices, pointing out the difficulty of obtaining a suitable person. He considered the salary offered (£600) too small, and moved, as an amendment, that the further consideration of this motion be adjourned till November, which was seconded by Mr. Read, M.P., as he considered the subject wants more consideration. Lord Vernon supported the motion to retain the Secretary. Lord Chesham suggested that the Secretary should receive £1000 on retiring. Mr. Turner pointed out that Lord Walsingham's motion would appoint Mr. Hall Dare to both offices. Mr. Randell and Lord Bridport urged decision at the present meeting, and want of courtesy in the non-reception of the Report. The President did not consider it as such. Mr. Thompson supported Lord Powis's amendment, the arrangements for the next *Journal* being sufficient for the present. On a division Lord Powis's amendment was lost by 17 Noes to 15 Ayes, and Lord Walsingham's motion was lost by 18 Noes to 13 Ayes. Lord Bridport then moved that an advertisement be issued inviting applications for the combined office of Secretary and Editor, at a salary of £600 per annum, which was seconded by Mr. Torr, and carried by 16 Ayes to 14 Noes.

Mr. Randell moved that the amount of remuneration to the Secretary be £400, which was seconded by Mr. Jonas, and supported by Lord Bridport. Mr. Amos recommended £600, which was seconded by Mr. Milward. Lord Bridport then moved that formal notice be given to Mr. Hall Dare that his engagement with the Society shall terminate on the 1st January, 1869, and that he be presented on that occasion with £600, which was seconded by Mr. Torr and carried.

The President then informed Mr. Hall Dare of the result, and expressed regret at the decision which would deprive the Society of his services.

THE WEST OF ENGLAND VETERINARY MEDICAL ASSOCIATION.

The Annual July Meeting of this Association was held at the Queen's Hotel, Exeter, on the 9th ult. The following members were present:—T. D. Gregory, Esq., of Bideford, President; Messrs. E. Drake, T. D. Broad, J. J. Collings, J. E. Cornelius, W. Ward, H. W. Thomas, J. P. Heath, and J. A. Collings.

The minutes of the previous meeting at Bristol were read and confirmed.

The President next proceeded with the chief business of the meeting, viz. the revision of the bye-laws of the Association, and the election of officers for the ensuing year, both of which matters were satisfactorily arranged. A copy of the revised code of laws will be forwarded to every member as soon as published.

Mr. T. D. Gregory was unanimously desired to prolong his Presidentship through the ensuing year, and at the same time was generally thanked for the kind and able manner with which he had already conducted his onerous duties.

Messrs. T. D. Broad, J. J. Collings, and J. E. Cornelius, were unanimously appointed Vice-Presidents.

Mr. E. Drake, of Exeter, Hon. Treasurer; and Mr. J. A. Collings, of Exeter, Hon. Secretary.

Sufficient time not remaining for full and ample consideration of Mr. T. D. Broad's paper on "Laminitis," the author was asked to make known the chief points of his essay (in order that they might receive mature consideration), and to defer the special delivery of his views until the following meeting at Bristol, both of which requests he readily acceded to.

It is to be hoped the members present may have an opportunity presented them of testing Mr. Broad's treatment with regard to this disease before the next meeting, and, if as successful as he has been, a great boon must necessarily be conferred on the suffering equine species, and a grand addition made to our curative means in foot diseases.

The official business being transacted, the members sat down to a substantial dinner, after which the usual loyal and professional toasts were given and responded to.

The next meeting is appointed for Bristol, in November next, of which due notice will be given.

J. A. Collings, *Hon. Sec.*

THE LANCASHIRE VETERINARY MEDICAL ASSOCIATION.

The twenty-third quarterly meeting of the above Society was held on Wednesday evening, June 10th, in the Royal Institution, Mosley Street, Manchester.

The President, Thomas Taylor, Esq., occupied the chair.

The following gentlemen were also present:—Messrs. Thos. Greaves, Peter Taylor and Haycock, Manchester; Geo. Browne, Jas. Taylor and F. Bland, Oldham; A. Lawson, Bolton; Woods, Wigan; Morgan, Liverpool; A. J. Owles, 6th Dragoons; T. Greaves, Nottage; J. A. Taylor and W. A. Taylor.

The minutes of the last meeting were read and confirmed.

The President, in opening the meeting, referred to two letters he had received, one from Mrs. Litt, the other from Mrs. Hampson, acknowledging the receipt of their letters of condolence, and thanking the members of the Society for the great respect they had shown towards their deceased husbands.

Mr. P. Taylor nominated Mr. Frederick Bland, of Oldham, as a member of the Association.

After some remarks from Messrs. Haycock, Greaves, A. Lawson, and P. Taylor, respecting the expediency of holding a conversazione in preference to the annual dinner, Mr. Greaves gave notice of the following motion to be brought forward by him at the next meeting, viz. "That at the annual meeting the President should read his inaugural address, and after which any gentleman might bring forward some subject for discussion, either written or otherwise. The meeting to be held at the Trevelyan Hotel."

Mr. Greaves then brought forward his motion of the evening, and proposed that the Society should hand over a donation of £50 to the funds of the Veterinary Medical Benevolent Society.

Mr Haycock thought it far more preferable to give only £10 to commence with, as afterwards it might be increased if deemed necessary.

Mr. A. Lawson objected *in toto* to the appropriation of the funds of one society to that of another.

Mr. Morgan supported Mr. Greaves' motion.

Mr. Greaves, again urging his motion, asked if any one would second his proposition.

Mr. Browne thereupon seconded the motion. He said that in consequence of his present state of ill-health it had caused him to reflect more than before on the necessity of this benevolent institution, and in concluding said he should have great pleasure in assisting in anything that would further the interests of the Veterinary Medical Benevolent Society.

Mr. P. Taylor expressed his intention that he should give his vote only on condition that some of the other associations could be induced to co-operate with them in this benevolent donation.

The President then put Mr. Greaves' motion to the vote, which was carried by a large majority.

Mr. Morgan was then called upon by the President to read his essay on "Treads and Coronary Wounds."

It is needless to say that the subject was handled by the essayist in a most practical and scientific manner. The discussion it elicited was of a most interesting character, insomuch so that no two gentlemen could agree as to the whole of the minutiæ in the treatment of these sometimes very serious wounds.

The following gentlemen took an active part in the discussion :— Messrs. P. Taylor, Greaves, Haycock, A. Lawson, Woods, and A. J. Owles.

Mr. P. Taylor proposed, and *Mr. Greaves* seconded, a vote of thanks to the essayist, in which all present heartily concurred.

This concluded the business of the meeting, and the members then dispersed.

W. A. Taylor, *Sec. pro tem.*

APPOINTMENT OF A DEMONSTRATOR OF ANATOMY AT THE ROYAL VETERINARY COLLEGE.

The Governors of the Royal Veterinary College, at their quarterly meeting, held July 18th, appointed Mr. J. W. Axe, M.R.C.V.S., Tuxford, Demonstrator of Anatomy, the office having become vacant by the lamented death of Mr. O. W. G. Brown. Mr. Axe obtained his diploma April 26th, 1866, and during his pupilage he distinguished himself by his devotedness to scientific pursuits. He was also the successful competitor for the Coleman Prize—silver medal —and the Veterinary Medical Association prize medal.

PARLIAMENTARY INTELLIGENCE.

METROPOLITAN FOREIGN CATTLE MARKET BILL.

Late on Friday night, July 24th, this Bill was withdrawn by the Government after another protracted and stormy debate. Throughout the progress of the measure in the House of Commons a continuous opposition was given it, by a minority powerful in argument and determined in action. This was especially shown by the course adopted on Thursday, July 23rd, when immediately on the time arriving for the house to assemble, a "count out" took place through the exertions of Mr. Ayrton. Under the circumstances, this could only be regarded as sharp practice to effect another delay. Indeed, no opportunity has been lost in obstructing the bill which the rules of the House would permit.

THE CATTLE PLAGUE.

In reply to *Mr. Liddell*,

Lord R. Montagu said about a week ago he had received intelligence that an outbreak of the cattle plague had occurred in Egypt,

and that morning he had received a telegraphic communication of an outbreak in St. Petersburg and Volnye, in Russia. He was not aware of any official communication on the subject, but he would inform himself on the matter before nine o'clock that evening.

THE SCOTCH CHARTER.

THE following is the text of the letter which was sent by the Clerk of the Council to the Highland and Agricultural Society, through the Parliamentary Agent, conveying the decision at which the Government had arrived relative to the Charter which had been sought to be obtained for Scotland:

"COUNCIL OFFICE; *May* 15*th*, 1868.

"SIR,—I am directed by the Lords of the Council to inform you that their Lordships have had under their consideration the petition lodged by you at this office, on behalf of the Highland and Agricultural Society of Scotland, and of the trustees of the late Professor Dick, praying for the grant of a Charter of Incorporation to the Royal Veterinary College of Scotland, and I am to state that their Lordships, after mature deliberation, find themselves unable to recommend Her Majesty to grant the Charter prayed for.

"I am, &c.,

(Signed) "ARTHUR HELPS.

"John Graham, Esq., 3, Westminster Street."

We have received the following communication relative to the Scotch Charter:

GENTLEMEN,— DALKEITH; *July* 8, 1868.

"Mr. Waldegrave Leslie has given notice that he intends to move an address for copy of all correspondence between the office of Her Majesty's Privy Council and the Board of Trade and the Highland and Agricultural Society of Scotland and other parties in Scotland regarding the grant of a Royal Charter to the Veterinary College of Scotland. Mr. Newdegate will move to add to this motion for copies of the charter granted to the Royal College of Veterinary Surgeons in the year 1844, and of any correspondence relating thereto, and to the subject of the above correspondence."

The above extract is from the *Scotsman* newspaper of to-day, and I beg to state, "That if the Highland and Agricultural Society of Scotland intend to interfere with the examination of the students taught at the Edinburgh School in Clyde Street, as they have been doing for more than thirty years, whether that school gets a charter or not, it will be a disgrace to the veterinary profession."

The Highland Society gave twenty-five guineas a year to the late Mr. Dick, which was good, as it had a tendency to stimulate im-

provement, at least it was intended that it should do so. But what was the result? The Highland Society sent a convenor to every examination, who took the chair. He possessed the book with all the names. The examiners might be perfectly qualified for their task, but *they* were never consulted. Whenever a student was examined Mr. Dick walked up to the convenor, held a private consultation with him, and there and then the fate of poor Mr. Student was sealed. That convenor, in no case I ever saw, was a judge of the veterinary student's abilities, and the system gave Mr. Dick the entire control of passing or not passing any one he chose.

If the present Clyde Street School be intended to be carried on in the same way the sooner it is annihilated the better, and the provost and magistrates, or the general public, establish a Royal Veterinary College, where properly qualified examiners shall pass the students independent of the control of any man.

Yours, &c.,

J. Horsburgh, M.R.C.V.S.

WATERING HORSES.

To the Editor of the 'Sheffield Independent.'

Sir,—The very common mistake made by keepers of horses in limiting the supply of water to them induces me to ask to be allowed to draw attention to the fallacy. The oppressively warm weather urges me, just now, to address you in behalf of the many thirsty animals, which are perhaps doing extra work because of the weather, and to which the supply of water is most meagre. Many owners of horses, most grooms, and others who have the charge of them, profess to know how much water a horse ought to be allowed; and when a poor, thirsty, over-ridden animal arrives at his journey's end he is treated to a very limited supply, and the pail is taken away before his necessity is half met.

It is a mistaken notion that cold water frequently produces "colic." I have often known it *cure* that disease. When cold water does cause abdominal pain it is from long abstinence, and the horse drinks to excess. But even this is rare. I allow my own horses to drink at every trough I meet with in the road—if the water be clean; and in my own stud I never had a case of colic. At home my horses always have water before them.

A friend of mine, to whom the other day I gave this advice, directed his servant to adopt it. The servant shook his head, and said "he thought he knew as well as Mr. Cartledge when and how much water his horses required." The owner, in reply, told the servant that that might be so, and if he would allow his horses to drink as often and as freely as he did himself, he (the owner) should be satisfied. I recommend that doctrine for general adoption.

Yours very faithfully,

R. Cartledge.

Market Street; 17*th July*, 1868.

DEGREE OF PH. D. CONFERRED ON MR. M'BRIDE.

THE University of Rostock, in Germany, has conferred the degree of Doctor of Philosophy on Mr. John A. M'Bride, M.R.C.V.S., Professor of Cattle Pathology in the Edinburgh Veterinary College. —*Scotsman*, 20th July, 1868.

OBITUARY.

WE have to record the following deaths, viz.—

Gabriel Isles Rollings, Royal Artillery. Diploma dated May 19th, 1853.

Christopher Townsend, Long Sutton, Lincolnshire. Diploma dated February 4th, 1830.

Samuel Bland, Alfreton. Diploma dated January 24th, 1822.

James Davy, Birmingham. Diploma dated August 23rd, 1848.

Robert Moore, Upper Berkeley Street, Portman Square. Diploma dated May 19th, 1863. We regret to learn that the death of Mr. Moore resulted from a fall from his horse.

According to the report of the Registrar to the Royal College of Veterinary Surgeons, the following deaths have also recently occurred:

Henry B. Arthy, Stanway, Colchester. Diploma dated February 27th, 1839.

Thomas Brockbank, late of Carlisle. Diploma dated April 29th, 1826.

John Lyon Prescott. Diploma dated April 23rd, 1845.

Thomas Insley, Warrington. Diploma dated February 27th, 1839.

John Simpson, Liverpool. Diploma dated April 27th, 1846.

Henry Turner, Walthamstow, Essex. Diploma dated February 25th, 1827.

Robert Howes, Aylsham, Norfolk. Diploma dated December 3rd, 1833.

Thomas Webb, Denston, Suffolk. Diploma dated April 30th, 1851.

John Hay, Lauder, Berwick. Diploma dated April 30th, 1862.

Joseph Hall, Leominster. Diploma dated July 18th, 1821.

Daniel Herbert, Chester. Diploma dated June 21st, 1843.

Joseph Huthart, Alcester, Warwick. Diploma dated May 1st, 1862.

John Ashton, Seven Oaks, Kent. Diploma dated January 25th, 1820.

ERRATUM.

IN our last number, among the names of those who had been appointed Acting Veterinary Surgeons, that of *John* Bunnel was inserted in the place of *Jonathan* Bunnel.

THE

VETERINARIAN.

VOL. XLI. No. 489. SEPTEMBER, 1868. Fourth Series. No. 165.

Communications and Cases.

ON THE TRANSFERENCE OF MANGE MITES FROM INDIVIDUAL ANIMALS OF ONE FAMILY TO THOSE OF ANOTHER, AND THE SUBSEQUENT DEVELOPMENT OF CUTANEOUS DISEASE.

By Professor Brown.

It has been very generally contended that mange in each species of animal is caused by a variety of acarus proper to the individual, and that although accidental transference of the mites may occur from one animal to another, the parasites will not adapt themselves to their new location, but either perish or migrate to some more favorable situation. Occasionally, irritation is induced by the invasion of parasites which are foreign to the particular animal, as in the case of poultry lice getting upon the skin of the horse, and there is also reason to believe that the mange mite of the dog will produce great excitement, and, indeed, cause a disease in the skin of the human subject very much like itch; this has frequently been observed to happen to ladies' when their pet dogs have contracted mange. It is true that their owners generally deny that their favorites share their beds, but they may by a skilful cross-examination often be led to admit that the animals sleep in the same room, and sometimes take up a position at the bottom of the bed, of course on the outer covering. A circumstance occurred in the practice of a professional friend that may perhaps justify the indulgence of a belief that the dog is not always content with a location outside the bed. A canine pet with an affection of the skin

was consigned to our friend with the strictest injunctions for attention to be paid to his domestic comfort; and with the intent to meet the owner's wishes, the dog was given over to the charge of the man who arranged a bed for him in his own sleeping room. Everything went on well until the attendant retired to rest, when the dog manifested a desire to share his couch, but was prevented; as soon, however, as the man had fairly ensconced himself beneath the bed-clothes, the dog made a violent rush, and thrusting his head under the covering quickly penetrated to the bottom of the bed, and quietly curled himself up in what was evidently his accustomed place. A mangy dog under such circumstances is certainly most favorably placed for infecting the person who occupies the bed, as the acari, stimulated by warmth, would be very likely to wander, and, perhaps, find a new habitat upon the integument of the individual; and if they succeeded in burrowing beneath the cuticle at once, they would probably deposit ova which would be hatched; and even if the young brood should not become mature, there would be considerable irritation established, and a spurious itch might continue to exist for some time. Beyond this occasional result of the transference of the mange insect of the dog to the human being, observation has usually negatived the idea of mange being communicated from one animal to another of a different species, but recent investigations demonstrate the existence of a cause of mange in the horse which has hitherto not been suspected.

In the *Recueil de Médecine Vétérinaire* for May, 1868, M. Méguin gives the details of an experiment which he instituted with the mange mite of the cat, Sarcoptes notoedre (the term Notoedre is derived from *νῶτος* the back, and *ἕδρα* the anus). This acarus is distinguished by the position of the anal opening which, instead of being situated as in other species at the posterior part of the ventral surface, is placed at the posterior part of the dorsal surface, as seen in the illustration (page 596), which was copied from M. Méguin's memoir and slightly altered, being represented as a transparent instead of an opaque object, and reduced in size for the sake of comparison with the acarus of the human subject, and also with that from the sheep.

Many acari make burrows or galleries in the skin, and are hence termed Sarcoptes, while others merely attach themselves to the surface, and are distinguished as Dermatodectes. The itch mite of man is the type of the one species, and the scab mite of the sheep a characteristic example of the other; both these parasites are represented in the accompanying figures.

An inspection of the illustrations will show that there are

Acarus ovis (male), from a sheep affected with scab.—Magnified fifty diameters.

Acarus scabies (female), from the human subject. (Itch.)

very important differences in the conformation of the two animals; the itch mite (Acarus scabies) has remarkably short limbs which are adapted for burrowing, while the scab mite (Acarus ovis) has much longer legs, which enable it to cling to the skin and wool of the animal which it infests.

It is not in accordance with the present purpose to enter into a detailed account of the habits of the various species of acari; but it is worthy of remark that they differ materially in their rate of development. Taking the Acarus scabies of man as a prominent example of the family, it has been ascertained by experiments that the process of depositing, hatching the eggs, and the growth and progress of the young brood towards maturity, occupy some weeks.

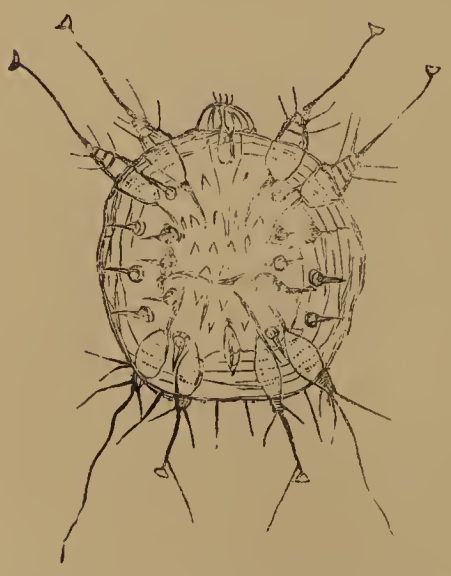
According to the observation of Gudden and other German authorities, the mature impregnated female acarus when placed upon the skin proceeds to bore a gallery in which it lays its eggs. The young brood of six-legged mites, becoming eight-legged after a change of skin, appear in ten to fourteen days, and at the moment of their eruption the individual experiences a sensation of gnawing and pinching. After three changes of skin, each change occupying about a week, with an interval of five or six days between, the young

mites become mature, and acquire sexual organs. Thus, it requires a period of nearly seven weeks for the production of a new generation of sexually-mature acari from the ova deposited by the parent.

In reference to the development of the young of the sheep acarus, the information which has been obtained is not so exact, and the difficulties in the way of watching the proceedings of parasites upon the woolly skin of a sheep are almost insurmountable; it has nevertheless been ascertained that the ova are hatched in about ten days, and that the six-legged brood very quickly acquire eight legs, and become sexually mature in less time than the itch mite does; this is probably dependent upon the circumstance that the scab mite does not make galleries, but deposits the ova on the skin. The frequent repetition of the burrowing process by the itch mite of man necessarily occupies much time, which saved is by the dermatodectes, and hence the progress of scab in sheep is considerably more rapid than that of the itch in the human subject.

M. Méguin's experiment upon the transference of the sarcoptes of the cat to the skin of the horse was attended with results which are interesting on account of the development of a decided mange which advanced slowly at first, but progressed with rapidity when it was once established. The interval of quiet which the subject experienced after the mites were transferred to his skin was in all probability occupied by the acari in making burrows and depositing ova, and as in other instances it was not until the young brood was hatched out that signs of itching were apparent.

Sarcoptes notoedre is the mange mite of the cat, and is recognised as the smallest of the family, being little more than one third the size of the itch mite of the human subject.



Male Sarcoptes notoedre, from a cat affected with mange, magnified 50 times.

The figure which is here given will convey an idea of the form and general characters of the parasite.

This variety of acarus penetrates the skin in the manner of the human acarus; the males are nearly of the same size as the females, instead of being considerably smaller, as in other species of acari, but they are distinguished in the same way by

the absence of the so-called sucking cups on the third pair of feet, while they are well developed on the other three pairs.

For the purpose of the experiment an adult horse in good health was selected. On Jan. 3, 1868, a portion of skin from a cat affected with mange, and which was ascertained to be covered with acari, was fastened on the left side of the withers. After being kept in this position for twenty-four hours it was removed, and found on examination to be free from acari. It was accordingly concluded that the mites had passed from the skin of the cat to the horse. During a period of ten days the horse was watched without any sign of irritation of skin being detected, but on the eleventh day the animal was observed to bite as near the part which had been in contact with the diseased skin as he was enabled to reach.

This symptom of the existence of mange was exactly what might have been expected, and was in accordance with what has been observed in reference to the itch of man and scab in sheep, but a peculiarity immediately presented itself: instead of the disease advancing in the usual manner, there occurred a second period of calm for the space of five days, from January 15 to January 20, in which latter day the itching reappeared, and did not again cease.

The horse's skin was denuded of hair in patches behind the part to which the cat skin had been applied, and the itching was particularly violent during the night. A considerable surface of diseased skin was freed from the hair by clipping, and it was then seen that the acari had followed the course of the hair, moving regularly from before backwards and downwards. On January 25, three weeks after infection, the disease had advanced considerably from the part to which the diseased skin had been attached, and threatened to gain the flank; the ravages, however, of the malady were confined to the left side.

In a few more days the affection appeared to subside on those parts of the skin which had been clipped, probably the cold induced by the exposure of the surface caused the acari to quit the position and occupy a fresh one. In any case the disease was detected in the right side on January 30th, and by the 10th of February had so far advanced that it was deemed necessary to terminate the experiment by the adoption of curative measures. The animal recovered under treatment, but so severe had the affection been that traces of its existence were still left, and, M. Méguin remarks, will not be entirely eradicated until the next change of coat.

By the institution of this experiment a doubtful point has been satisfactorily resolved, and the precise narration of

details relating to the time of development of disease may be of use hereafter in judicial inquiries. The investigation also opens up a question as to the probability of there being other species of acari, which are capable of a successful transference to animals not naturally obnoxious to their attack.

FIBROUS CLOT IN THE BRAIN OF A HORSE.

By John Lawson, Sen., M.R.C.V.S., Manchester.

On the 7th of last November I was called to attend a well-bred black mare, of the waggon breed, the property of Messrs. Joseph Hadwin and others, at Fairfield, near Manchester. The animal had been very violent in the stable, rearing and plunging forward, frequently getting her fore feet into the manger. She was restless and excited, and covered with perspiration.

Until about an hour before I saw her, she had been in her ordinary health, to all appearance, and had eaten her last allowance of food even with avidity. When I arrived she was standing with her head thrust up as high into a corner of the stall as it was possible for her to get it, and leaning forward with all her force, so that no effort of mine could make her stir. She had a wild staring look, and the pulse was slow and full. With much difficulty, and with the assistance of several men, she was at length removed to a large loose-box. Looking upon the case as one of cerebral congestion, I had a sufficient quantity of blood abstracted; a full dose of purgative medicine was administered, and cold douches were constantly applied to the head. Next day there was marked improvement, and convalescence was so rapid and complete that in about ten days she was able to resume her ordinary duties. Until the 30th of April nothing unusual was observed; on that date, however, she had another attack similar to the first, but in about two hours the more urgent symptoms subsided, and I was not sent for until the next day. I then found her dull and stupid, with the left side of the head inclined towards the ground. There was no tendency to turn round, or carry the head more to one side of the body than the other; the pulse was slow and full. The better to observe the case and conveniently treat it, I had her taken to my hospital stables. The carter had much difficulty in leading her so far, as she walked with great reluctance, stepping high like a blind horse, and evincing much dread of everything she saw on the road, particularly if the object was elevated, as a laden waggon or a railway arch.

She was bled and purged again, the cold-water douches to the head were repeated, and blisters were applied behind the ears, but all to very little purpose. There being scarcely any improvement, and as I could not give the owners a very favorable report as to the probability of her ultimate recovery, she was sold to a small dealer, and on the 12th May removed from my establishment.

It was observed that she walked out of the yard remarkably well, but yet with the right side of the head turned upwards, and with rather a vacillating gait. Her new owner had, no doubt, excited her a good deal, for the same night she had another violent attack, and died before morning.

We made a *post-mortem* examination, and found the left lateral ventricle of the cerebrum completely filled with a fibrinous clot. This was firmly attached superiorly, and partially suspended through this attachment in the serous effusion, in which it appeared to float. I am inclined to think the mare made a complete recovery from the first attack, and that the exudative mass found in the ventricle was the result of the renewed inflammation that accompanied or caused the second illness.

THE QUESTION OF THE DAY: WHAT KIND OF EDUCATION WILL PRODUCE THE MOST EFFICIENT VETERINARY SURGEONS?

By Thomas Greaves, M.R.C.V.S., Manchester.

(*Continued from* p. 416.)

In my former paper I discussed to some extent the question of education in its general sense, and the influence of highly scientific culture upon the mind and habits of men, especially in reference to veterinary surgery. That paper has been honoured by an unusually long, most candid, and very able review from the Editors of this Journal. Such a review does great honour to our profession by the elevating and ennobling sentiments it contains. I shall examine them on some future occasion; in the mean time I shall consider the next question which I proposed for discussion.

Question 2.

"Is a sound English education, coupled with the greatest amount of practical knowledge that can be given to the youth, sufficient for all purposes?"

The answer to this question will very much depend upon the estimate which we form of the quality of the raw material; but be the quality of the material what it may, I submit it is much more likely to attain to a high degree of excellence by surrounding it with favorable and special circumstances, all tending to mould and adapt it to a specific purpose.

Education is not a work confined to the school or college. The child is not put into the hands of parents alone; it is not born to hear but a few voices: it is brought at birth into a vast, I may say, an infinite school; the universe is charged with the office of its education; innumerable voices come to it from all that it meets, sees, and feels: it is not confined to a few books anxiously selected by parental care; nature, society, experience, are volumes open everywhere, and they are perpetually before its eyes; it takes lessons from every object within the sphere of its senses—from the sun, the stars, the flowers of spring and fruits of autumn—from every associate—from every smiling and frowning countenance—from the pursuits, trades, and professions of the community in which it moves—from its plays, friendships, and dislikes—from varieties of human character—from constant conversation, and every surrounding circumstance and influence; all these are leaving their impress, and more than these are operating upon it—teaching, awakening, and developing the mind of the child—embodying, incorporating, and moulding the mind of the future man as it grows up amongst them; in a word, he is placed in a defined position, in which his whole nature is made to harmonise and to luxuriate.

It seems to me to be one of the main characteristics of human beings, not that they actually are much, but that they are something of which much may be made. The being is not so much a thing already as he is a germ of something; he is not like the seed of a plant, in whose development there exists no wider range than that between the more or less successful manifestations of its inherent nature. Give a young tree fair play, good soil, and abundant air; tend it carefully, in short, and you will have a noble tree: treat the young tree unfairly, give it bad soil, deprive it of needful air and light, and it will grow up a stunted and poor tree. But in the case of the human being there is more than this difference in degree. There may be a difference in kind; the human being may grow up to be (as it were) a fair and healthful fruit tree, or be a poisonous one. Shakespeare aptly observes "There is a divinity that shapes our ends." The philosopher or the divine might have grown up under influences which would have made them bloodthirsty pirates

or sneaking pickpockets. The pirate or the pickpocket, taken at the right time and trained in the right way, might have been made pious and exemplary men; hence it follows, and I think it will be evident to every one, that those circumstances which most closely surround the youth (and the law accounts all persons infants under twenty-one years) amongst which he is placed, for the longest period of time must unquestionably have the greatest and most permanent influence in giving to him a tone, tastes, feelings, and manners, in moulding his mind and forming his character; and this is true whether the circumstances are within an academy, and the surroundings are books with all the other accessories of learning, or, on the other hand, within a veterinary establishment, and the surroundings are sick and lame horses.

I will now suppose the youth has had a good English education, has been sent at sixteen or seventeen to a veterinary surgeon, to whom he is apprenticed. He serves three or four years, working industriously at the business, thus receiving a special education for his calling. Afterwards he goes to college, and, having got his diploma, he takes the management of a veterinary establishment. Observe such a one amongst a number of sick and lame horses waiting to be attended to; see him moving about, gliding in and out almost without noise; his work is no trouble to him, he goes to one patient, asks a few questions of the attendant, sees at a glance what the case is, what is wanted, does it, and then in like manner proceeds to the next and to the next. He performs the necessary duties with all the ease imaginable; he asks no roundabout, rambling, or unnecessary questions, but keeps to the point, does what is necessary to the patient and his duty to his master; there is chcerfulness, pleasantness, and satisfaction, and, what is more, there is success, because the case is treated properly, upon plain and sound principles. It is easy to perceive immediately that he has become well adapted for business from the regular course of training which he has received, and through which he has acquired a certain aptitude; that is to say, a habit, manner, method, and conduct in the performance of his work, which constitute together a broad avenue to success. He exhibits a regular and becoming line of conduct, pays attention to his duties, and it follows almost necessarily that, by a constant observance of these rules, his habits, opinions, and judgments, are regulated and systematised. He becomes quick of perception, prompt in decision, and firm in execution, yet cautious and deliberate, always avoiding rash and precipitate action; his mind is ever on the alert to gain fresh

and better knowledge upon the treatment of various diseases; he sees the neeessity of eontinuing through life to make vigorous efforts for attaining to higher truth and wider knowledge; he instinctively, as it were, aims to gain elear and distinet views, resolving his ideas to useful and praetieal purposes; he has Lord Brougham's idea written in his brain, when he said, "If I were a shoeblaek in London I would try to be the best shoeblaek in London." In the performance of his duties he studies to make his ideas and disposition, his conduct and charaeter, to be in unison, so as to suit and harmonise with those of others by whom he is surrounded, or with whom he is neeessarily brought in contact; the idea of caste is not always erossing his path like unto a great stalking-horse; he eultivates a pleasant, agreeable, eourteous, and obliging manner. The nearer men approaeh to free and unreserved intereourse with eaeh other, the more smoothly the affairs of life appear to move forward. It is a law of our nature that the more agreeable we are the more gratification we experience.

The praetice of this knowledge he finds neeessary in his profession, which, although it is a respectable, useful, and most honorable calling, he finds, whilst in the performanee of his duties, he is eonstantly subjeeted to many annoyanees; he will have his opinions challenged, his judgment questioned, his plan of treatment tampered with, his motives impugned. He has to submit to disrespeet from ignorant inferiors; he knows that there will be many hardships, privations, and trials; he is liable to be ealled up at all hours of the night to ride or drive down long, lonely lanes, five, ten, or twenty miles in the dark, in the drenching rain, or bitter and piercing eold wintry winds; and when arrived at his destination he does not expect to find a roaring fire, with rest and refreshment in the dining-room, but he drives straight to the stable yard—*his work, his duties lie there;* he finds, perhaps, a painful and protracted case of spasm; he has to stand by his patient hour after hour. Or it may be a ease of diffieult parturition in a eow; he has to strip to the skin in the eold shippon, and for several hours to exert all his judgment and his strength until quite exhausted, and then home again to work on the live-long day.

These are some of the sweets of praetiee, the reward of whieh may be five or ten shillings for attendanee in the night over and above his visit and medieine. Where is the induee-ment for gentlemen, or the sons of gentlemen, or men of high seientific education, to embark in the profession, when it is found that the majority of its members do not realise more

than £150 per annum? We may quibble as we like, but it is of no use to deny the fact, that our duties lie in the stable, in the shippon, and with the servants. We cannot ignore or deny this, however gentlemanly we may be, or whatever high scientific attainments we may possess. Surely it is no disgrace to be what we are; surely it is no disgrace to possess horse knowledge; surely the deliberate opinion of those great men Coleman and Dick upon this question must not be cast aside as worthless. Further, a high scientific education implies means, money; and what, let me ask, does one of our greatest and wisest judges say in his reply to the question what contributed most to success? "Some," said he, "succeeded by great talents, some by a miracle, but the majority by beginning without a shilling." It is not to be denied that we, each and all of us, enter the profession for the ostensible purpose of gaining an honest, respectable, and honorable livelihood; surely it will not be averred that this is a low and vulgar view of our calling. Some few of us may be impelled by a deeper and more sublime aspiration, a thirst for something purer and higher than real life affords, and in the next paper this view of the subject may be considered.

THE PRINCIPLES OF BOTANY.

By Professor Buckman, F.L.S., F.G.S., &c. &c.

(*Continued from p.* 508.)

We now commence a brief description of the different *organs* of plants, in doing which it will be our object not so much to enter into minute anatomical details as to point out the leading principles connected with structure and function.

The root.—If we examine a young plant, such as mustard, we shall find that it started into life by sending an elongated cellular structure downwards, which is the root or *descending axis;* this, as growth proceeds, sends out lateral fibres or rootlets, the whole of which, and especially the extreme tips, are composed of loosely packed cellular tissue, which have got the name of *spongioles* (little sponges), which are, indeed, the extreme absorbent parts concerned in the important root function of imbibition of nutrient chemical matters from the soil.

Coincident with this root growth the upward or *ascending axis* of stem, to be clothed with leaves, and ultimately to produce flowers and fruit, is being developed.

Roots and stems in their earlier stages are scarcely dis-

tinguishable, being composed of simple cellular matter. Later, roots assume a more specific form, differing from stems in that they for the most part grow underground, are without colour—or, at least, green colouring matter—have no pith, and do not produce leaves. Hence the tubers of the potato and Jerusalem artichoke, from having eyes or buds, are not roots, though sometimes so called, but belong to what are termed rootstocks, which form tubers, where the cellular matter is stored up in the rounded fleshy form—*rhizonata*, or creeping underground stems, as in the mints, some thistles, couch grass, &c.

True roots are of three family forms, corresponding to the three great families of plants. Thus, we have—

1. Roots of *Exogens*.
2. Roots of *Endogens*.
3. Roots of *Acrogens*.

Exogenous roots.—These are mere branchings of the downward radicle. These roots were called *exorhizal* by Richard, because the parts elongate directly from the point, and present simple or compound branchlets, and, as stated by Balfour, in some cases, as in the walnut and horse-chestnut, there is a prolongation of the pith into the root to a certain extent—a fact we have especially seen in growing horse-chestnuts over water as a room decoration.

Endogenous roots.—In these, as may be seen in a malting barleycorn, the primary radicle is only a sheath, from and through which the rootlets are pushed, much after the manner of the inner from the outer portion of a telescope. Plants in which such a plan of root is found are called Endogens, as distinct from the former, which are Exogens, and the root is termed *endorhizal*—growing from within.

Roots of Acrogens, &c., proceed from the base of the stem, as in those of the true flowering plants; they are simply cellular, starting from no well-defined point. In some of the higher Acrogens, as in a tree-fern, these roots are found all round the base of the stem of which it forms part of the structure; thus, the stem is enlarged to some three or four times, forming an expanded base to the trunk of the union of roots outside the true stem. Such roots are called *heterorhizal* (diverse), from the uncertain method of their development. Here, then, we have been describing the true roots of different families of plants, attached to which will be peculiar forms of stems, leaves, and seeds; but there are many underground plant structures commonly called roots (radix) which may now be mentioned; such are, among others—

The *rhizomata* of ginger, called in our Pharmacopœias

Radix zingiber, containing the well-known pungent aromatic qualities for which this is a valuable condimental spice, as well as a useful medicine; the rootstock of gentian, known as *Radix gentiana*, a bitter and tonic. Thus, we have nominal medicinal and esculent roots, which show that the underground growth of plants possesses very varied properties, far different from those belonging to true roots, the proper functions of which have now to be described.

Functions of roots.—The most obvious use of this part of a plant is that of fixing it in the soil, or otherwise securing it to its growing medium. Some plants have no attachment to the soil, as the *Cuscuta* (dodder), in which *aerial* rootlets pierce the foster-parent, and by and through these it is not only attached but also nourished. The ivy has roots attaching it to the soil, and aerial ones by means of which it climbs and adheres to trees, walls, &c.

As regards the life of the plant, it will be seen that roots perform the important function of absorbing matters from the soil which elaborate in its growth and nutrition; this it does by means of its spongioles, which are more or less exposed cells, at the extreme ends of the rootlets, and thus from cell to cell a circulation is maintained by which nutriment from the soil is sent from one part of the plant to the other throughout its whole structure. It will be seen, then, how important it is that in transplantation the fibrils should be cared for and kept as much as possible from injury, and thus it is that soils so aptly mixed as not to expand with rain or crack up in drought will be found to be the best mechanical media for vegetation, as in the one case these are not pushed out of place, and in the other the fibrils are not torn from the parent plant.

In active growth new root-fibrillæ are constantly forming, so that fresh unclogged cells are always being brought into action with which to carry on the endosmosic circulation, whilst at the same time the larger roots increase in size and length in proportion to the strain required for the support of the plant in its place, and provide for the strain caused by winds and the like; hence these larger roots are called *moors* by the woodman, as they are the means by which trees are securely anchored in their places. The older parts of roots would also appear to be reservoirs of various organic materials, such as starch, inuline, gum, sugar, &c., some of which, as in the turnip and carrot, act as a storehouse of food garnered up in one year for the production of the stems, flowers, and seeds of the second season, and it is this thorough

development of feeding matter from biennial growth that make *roots* such valuable food, as such store for the second year's growth of a plant is just of that kind as will be found useful for the food of stock; but inasmuch as these products differ in different seasons and at different times in the same season, the successful feeder, to act upon and to understand principles, should become acquainted, not only with the laws of *animal*, but with those of *vegetable* physiology.

Roots were at one time supposed to have a power of selecting such food as was best adapted for the growth of the plants to which they belonged; and though it is just possible that the cell-walls of one plant would be capable of having passed through them imperfect solutions which would be incapable of entering the cells of other species, yet it seems pretty clear that plants have no power of selection, and hence, placed in soil unfitted for them, they get on but poorly if they do not die altogether, and poisonous solutions applied to the roots inevitably kill the plants, such would arsenic, sulphate of copper, salt, and a host of others. Neither do we consider that roots have a considerable, if, indeed, any excretionary power, so that chemical solutions, once entering the circulation through the spongioles, pass onwards, affecting the plant for good or evil according to their nature, and hence it is that different soils are fitted for various plants, and not all for the same kind, and the absence of requisite qualities must be made up by judicious manurial applications, whilst the presence of objectionable matter in the soil will render it unfit for the production of some vegetables until it becomes altered by the addition of new matters, thus diluting the material or inducing new innocuous combinations, subjects which we must further consider in combination with the functions of leaves.

(*To be continued.*)

LUSUS NATURÆ LEADING TO DIFFICULT PARTURITION IN COWS.

By W. Wilson, Broughton, near Preston.

Since writing you last I have had two cases of difficult parturition in cows, each, perhaps, sufficiently interesting to admit of publication. The first case occurred in an aged cow of the Yorkshire breed, which had been sent down to the Preston market by Mr. E. Rigby, cattle-dealer. I saw the animal about ten o'clock in the morning of April 20th,

and was informed that the "water-bag had burst" between three and four on the afternoon of the day before, and that she had been in pain all the night. Two or three persons had "felt for the ealf," but eould not understand matters. The presentation was very peeuliar. The head and fore legs of the fœtus were in natural position, but the two hind feet were also in the passage, one resting on the spine and the other against the right shoulder of the ealf. Eaeh leg had its posterior part plaeed upmost. At first, faneying there were two ealves, I tried to return the hind legs into the uterus, but they were immovable; nor could I change the form of presentation. Under these eircumstanees I was reluetantly eompelled to resort to the knife, for the purpose of detaehing eaeh hind leg at the stifle-joints. This being done, I was agreeably surprised to find the fœtus slipping into better position, so that the cow was enabled to ealve without mueh assistanee. An examination of the fœtus showed that the position of the hind legs depended upon a twist in the loins.

I may remark that during the whole time that I was oeeupied—about an hour and a half—the cow had but few parturient pains. Shortly after delivery the eow took to eating hay, and suffered so little that she was sold in the market on the day following. Her period of gestation was complete.

The next is a somewhat singular ease. The subjeet of it was a crossbred English eow, four years old, the property of Mr. Levi Yates, Whittingham. She was put to the bull June 16th, 1867, and eonsequently the usual period of pregnaney would expire Mareh 23rd, but she did not show any symptoms of ealving until the 4th July, being nearly fifty-five weeks. The presentation was quite natural, but the fœtal limbs were of excessive size. Fortunately, the eow was particularly "roomy," so that I did not use the knife further than to make an opening into the ehest of the fœtus, through whieh to abstract the eontents of the thorax and abdomen, and thus to lessen its size. The poor beast suffered severely in labour, having the calf in the passage for more than two hours, under the united pull from time to time of three or four persons. As soon as I got the ealf away, fearing the effeets of the hot weather, I took away the placenta. Speaking eomparatively, I never saw the vagina and other parts less bruised or injured, but they had carefully timed the pulling and "*easing*" of the ealf. The eow was eertainly mueh exhausted, but a few quarts of ale to recruit her strength helped her mueh. The day after she appeared to be doing well, and eontinued to progress favorably.

There was a strange malformation of the head of the fœtus which I proceed to describe. It was not larger in size than is usual in a female calf, which was the sex of this one, but, as far as an external examination indicated, the nasal bones were entirely missing. Nor were the nasal openings present, as the skin at the part where these should exist was drawn out in the form of a simple but well-haired flap. On the under part of this flap, which was about three inches long, the lower jaw, mouth, and tongue appeared to be properly formed. The fœtus was a Cyclops, as only one eye existed, and this in the centre of the forehead. The eye was very imperfect, and the eyelids were much contracted and ran parallel to the longitudinal suture. The external ears seemed to be perfect in form, but the meatus auditorius externus was closed in both of them. With the exception of the missing nose and eyes, the head did not look particularly misshapen. The calf measured thirty-seven inches round the body just behind the elbows. This was the only part I measured. The greatest measurement would have included the arms and shoulder-blades. Possibly, too, there the measurement was something less than natural, owing from viscera of the thorax having been removed, thus allowing of collapse. A few days since I measured a healthy three-months-old heifer calf, and found that it was forty-one inches in girth. I should have mentioned the fœtus was dead, but that it had not been so long, as no decay had set in. The vessels also contained good red-coloured blood.

THE ASSUMPTION OF THE TITLE OF VETERINARY SURGEON.

By "Con."

The deep interest which I feel in veterinary affairs must be my excuse for asking you to kindly grant me space in your next issue for a few remarks respecting the present condition of the profession.

I had hoped that ere this something would have been done by Parliament to prevent the groom, the blacksmith, the cowleech, and other pretenders, from styling themselves veterinary surgeons. It is a serious drawback to veterinary science that such persons should be allowed to so designate themselves, and thus mislead the public, and not only so but to reap the same advantages as the duly qualified veterinarian

who has spent both time and money in obtaining his diploma. Under such circumstances there is surely but little inducement for well-educated young men to join the profession. In my opinion we require a law, not merely to prevent unscrupulous people from assuming false titles, but that no man should be allowed to practise veterinary surgery unless he is duly and legally qualified. Be this as it may, it is certainly true that until some distinction is made between the qualified and the unqualified practitioner, the profession will not be appreciated as it deserves to be. In the town where I am located there are several quacks, or so-called running doctors to contend with. One of these, who until very recently was a shoeing smith in London, does not only appropriate to himself the title of veterinary surgeon, but I am informed that a short time ago he placed at the head of his bills the letters M.R.C.V.S. With such bounce as this, he does a fair amount of practice, and until very recently the public were under the impression that he was a graduated member of the profession. When we see cases of this kind, and are ourselves without legal power to prevent them, I believe every one will agree with me that it is high time something was done to put a stop to such quackery and imposition. Its suppression would not only be a benefit to the profession, but a great advantage to the public.

I hope that a subject so important as this will be taken up by abler hands than mine, and that every member of the profession will put his shoulder to the wheel, so that the matter may not be allowed to rest until we have obtained our rights.

Yours, &c.

VISIT TO DR. HARVEY'S TOMB.

By Isaac Seaman, M.R.C.V.S., Saffron Walden.

About a month since, Drs. B. Richardson, Lloyd, Winslow, with other distinguished medical men of London, paid a visit to Hemstead Church, the resting-place of the remains of the immortal Harvey, the discoverer of the circulation of the blood. I had the honour of being present. Dr. W. Harvey was the son of Mr. Harvey, a merchant of London, whose country residence was at Hemstead, Essex. Nothing remains of the mansion but the site, a pasture of about an acre and a half, surrounded by a moat of great width. Mr. Harvey died in

the year 1657, aged 79. There are in the vault of the church fifty-two tombs, all of the Harvey family, that of Admiral Harvey being one of the number.

The dame who showed the vault had been servant to a descendant of the doctor, and appeared well up in the history of the Harvey family. One gentleman suggested the removal of the remains of the doctor to a place more appropriate for so great a man. "But," said the dame, "the doctor left all his money to the College of Physicians, and the College has not taken any notice of the tomb for 200 years; and Mrs. Bramston, who is a descendant of Dr. Harvey, will not allow the coffin to be removed." The coffin is made of lead; the roof is depressed, giving it a trough-like appearance. There is a long slit in it, and the contents examined through the slit appeared like black mud. There is no tomb of the doctor's wife; the family do not think there ever was a Mrs. Harvey, but Dr. Richardson said that in some of his works Dr. Harvey speaks of his wife's parrot, clearly showing there was a Mrs. Harvey. A very singular incident which occurred in the life of Harvey was mentioned by Dr. Winslow. The doctor had intended crossing to France on a certain day, but the night previously dreamed he was sailing, and the ship and crew were lost. In consequence of the dream the doctor did not go. The ship sailed at the appointed time and was lost with all the crew. The circulation of the blood had not then been discovered, and had not Dr. Harvey been forewarned of the catastrophe his grand discovery might have been deferred for another century.

THE HIGHLAND AND AGRICULTURAL SOCIETY'S VETERINARY EXAMINATIONS.

By Finlay Dun, Shipston-on-Stour, formerly Lecturer on Materia Medica and Dietetics at the Edinburgh Veterinary College.

Gentlemen,—In your August number Mr. J. Horsburgh, M.R.C.V.S., of Dalkeith, endeavours to enlighten your readers regarding the Edinburgh Veterinary College, and the examinations for the Highland and Agricultural Society's Veterinary certificate. The epistle is made up of a strange jumble of insinuations, errors, and misstatements, and lest its publication in your respectable Journal may mislead any of your readers who are not particularly

well informed on the subject, you will, I trust, permit me a few words of reply.

After simply quoting Mr. Waldegrave Leslie's request in the House of Commons that the correspondence relative to the Scottish Veterinary Charter be published, Mr. Horsburgh without apology or provocation bursts forth with the following unconnected and totally irrelevant statement:—"I beg to state, that if the Highland and Agricultural Society of Scotland intend to interfere with the examination of the students taught at the Edinburgh School in Clyde Street, as they have been doing for more than thirty years, whether that school gets a charter or not, it will be a disgrace to the Veterinary profession," p. 590. Your correspondent appears entirely to misunderstand the relations of the Highland Society to the Edinburgh Veterinary College. It is manifestly absurd to talk of the Highland Society "interfering" with an examination organised by its own members, and successfully carried on by a board of its own appointment for thirty years. As well might the Royal College of Veterinary Surgeons be arraigned for "interfering" with the examinations of the pupils of the Royal College at Camden Town, or the Colleges of Physicians and Surgeons blamed for "interfering" with the examinations which they hold of pupils connected with the various medical schools.

Conscientious men and competent judges may reasonably differ as to questions of professional politics, but few will be found to support the strong statement that the continuance of the Highland Society's examinations "will be a disgrace to the Veterinary profession." For thirty years, as your correspondent truly states—during the steady rise of the Veterinary profession throughout Scotland, the Highland Society's Veterinary certificate has been of signal service; it has been to hundreds a safe and sufficient passport to practice; it has been accepted as a legal qualification, not only throughout Great Britain, Ireland, and the colonies, but by the War Office, and formerly by the India Board; it was upheld by Mr. Dick in its earlier days because he contended that in many outlying agricultural districts, alike of England and Scotland, trained Veterinarians were required who could ill afford to pay the ten guinea fee of the Royal College of Veterinary Surgeons; whilst it has been more recently upheld because it was not considered wise to allow one corporate body to have the entire monopoly in the granting of Veterinary degrees, and in regulating the polity of the profession on both sides of the Tweed. I do not state this in

any spirit of factious opposition to the Royal College of Veterinary Surgeons, but merely as a general principle applicable alike to all vocations.

I should be the last to deny to Mr. Horsburgh, or any one else the liberty of thinking for himself on any subject. But no one has the right, unquestioned, to make such monstrous and unfounded statements as the following:—"The Highland Society sent a convenor [*sic*], to every examination, who took the chair. He possessed the book [what book?], with all the names [what names?]. The examiners might be perfectly qualified for their task, but *they* [*sic*] were never consulted. Whenever a student was examined Mr. Dick walked up to the convenor, held a private consultation with him, and there and then the fate of poor Mr. Student was sealed. That convenor, in no case I ever saw, was a judge of the veterinary student's abilities, and the system gave Mr. Dick the entire control of passing or not passing any one he chose."

I have attended the Highland Society's Veterinary examinations for eighteen years. For twelve years I have acted as an examiner. I am familiar with the system of examining at Clyde Street Hall, and I beg most emphatically to deny Mr. Horsburgh's statements and insinuations. Ever since I have known these examinations, the pupils have been examined at four separate boards; On anatomy and physiology; Chemistry and materia medica; Diseases of Horses; Diseases of cattle, sheep, pigs, and dogs. During the fifteen minutes' examination at each of these four tables, the examiners form their opinion of the capabilities of the candidate, who is either passed or rejected solely by the marks which he obtains at the several tables. Neither principal, professors, nor convener, interfere or are consulted in the matter. The convener or chairman appears to be a terrible bugbear to Mr. Horsburgh. One might almost fancy that some reprehensible convener had omitted Mr. Horsburgh's name or that of some of his friends from the lists of successful candidates which he draws up for publication from the reports of the examiners. "The convener," he bitterly remarks, in no case I ever saw was a judge of the Veterinary student's abilities. This is of a piece with the rest of the blundering. Surely Professor Goodsir, who was a most admirable and painstaking convener or chairman of the Highland Society's Veterinary department during ten years, and until the time of his death, was of all men in Europe qualified to "judge of a Veterinary student's capabilities." But it is idle seriously to controvert state-

ments so transparently absurd as those above quoted. It is impossible that the examiners constituting the Highland Society's board—men of the highest standing in the medical and veterinary professions—would lend themselves to such a farce as that described by your correspondent. Like many another hasty and disappointed partisan Mr. Horsburgh's case collapses in his attempt to prove too much.

Down to the very last paragraph in his letter Mr. Horsburgh's evil genius for falling into egregious mistakes pursues him. He says:—"If the present Clyde Street School be intended to be carried on in the same way (what way?) the sooner it is annihilated the better, and the provost and magistrates, or the general public establish a Royal Veterinary College, where properly qualified examiners shall pass the students independent of the control of any man."

He ought surely to know that the Veterinary College, Clyde Street, has nothing to do with the examination of her pupils. Like the Royal College at Camden Town, the Albert Institution, London, or the Glasgow Veterinary College, the Edinburgh College is only a teaching institution. She has no power or authority to license her pupils to practise. Nor is it desirable that she should have such authority. For the interest of all progressive education, the teaching and examining bodies should always be distinct. The Veterinary Charter, which Mr. Horsburgh speaks of in a previous paragraph, was not asked, as he erroneously states, for the Edinburgh teaching school, but for the Veterinary profession, and those interested in it throughout Scotland. In the absence of such a charter, the Highland Society will probably for the present continue their annual examinations, and grant their certificates to practice, which will shortly be supplemented by honorary degrees granted on further examination by the University of Edinburgh.

Whilst, in conclusion, we would advise Mr. Horsburgh to be in future more careful of his statements, he might also advantageously look to his grammar. Even sweeping reformers might demur to his consigning to annihilation, as he does in his last paragraph not only the Edinburgh Veterinary College but "the provost and magistrates, or the general public!"

[Both sides having spoken on this subject, the correspondence must be considered closed.—EDS.]

Pathological Contributions.

OPHTHALMIC DISEASE IN CATTLE AND SHEEP.

The information which we have received from various parts of the country shows that a disease of the eyes, both of cattle and sheep, having many of the pathological conditions of the affection known as staphylema, is raging endemically. Attacks of this disease are evidently connected in some way with an elevated temperature, and for several past summers the cases have been on the increase. Astringent applications are among the most efficient topical remedies, but in numerous instances blindness follows, the disease resisting all attempts at cure.

ASCITES IN LAMBS, ASSOCIATED WITH DEFECTIVE NUTRITION.

Our attention has been directed to a somewhat remarkable pathological fact connected with the long-continued drought and high temperature of the present season, *i. e.* the loss of a large number of lambs from ascites. One person has lost over a hundred, and many scores have been sacrificed in different parts of the country. We have had an opportunity, by *post-mortem* examination, of satisfying ourselves that all the organs of the body are free from structural change, and that the effused fluid is exceedingly limpid and watery.

Alterations in the quality of the blood, arising out of insufficiency of nutritive and other matters, appear to be the proximate cause of the disease. After effusion has taken place, it is vain to look to remedial means, but a generous diet of cake and corn and the exhibition of saline medicines will be effective as preventives if adopted sufficiently early.

THE CATTLE PLAGUE IN EGYPT.

The Cattle Plague has again manifested itself in Egypt, having broken out at Gheza and Gezera, near Cairo, and in

several other places in Lower Egypt. The Board of Health is taking every precaution to limit the extension of the disease; but, according to the latest information received, it is to be feared that many of the outbreaks are being concealed, and that the plague will consequently gain ground. Large numbers of cattle are shipped from Odessa, both for Turkey, Syria, and Egypt; it is, therefore, highly probable that the disease was thus introduced from Russia, as in former instances.

THE SIBERIAN CATTLE PLAGUE.

The Siberian Cattle Plague, to which attention was called in our last number, appears to be greatly on the increase. The malady has shown itself both in Livonia and Courland, and is rapidly making its way towards the Prussian frontier. Animals badly kept, and such as are located in ill-ventilated and damp situations, are especially prone to the plague. At the beginning of last month the subjoined telegrams were received, from which it is evident that Prussia is on the alert, and prepared to enforce any restrictive measures which may be necessary to prevent the malady crossing her frontier. The spleen, in common with other organs, undergoes pathological changes; but it is quite a misnomer to talk of the disease being inflammation of the spleen. According to official returns, this plague destroyed, in one of the Governmental departments of Russia alone—namely, Iver—during part of 1866 and the first eight months of 1867, 122 men and 33,080 cattle:

"THE CATTLE PLAGUE.

"GUMBINNEN; *August 1st.*

"In consequence of the existence of the cattle plague in several Russian districts near the Prussian frontier, the importation of cattle is interdicted. At Heydekrug only cases of inflammation of the spleen have occurred."

"GUMBINNEN; *August 2nd.*

"A veterinary surgeon of this district who has been sent across the frontier to examine into the truth of the alleged cattle plague in Russia, reports that he found only inflammation of the spleen (?) prevalent. This disease was, however, very widespread among the cattle. Several men had also been infected by it, and five had died."

VARIOLA OVINA.

Our flocks are again threatened with this disease, which has been introduced by sheep imported from Sehleswig-Holstein and Holland. Within the last fortnight infected cargoes have been landed at Poplar, Victoria Docks, Blackwall and East Smithfield. The inspectors detected the disease, and the Customs' authorities consequently refused to deliver the animals alive. In consequence of this, the owners were compelled to have the animals slaughtered on the wharves.

Notwithstanding the vigilance of the Customs' Inspectors, there is good reason to believe that some infected sheep were sent to the metropolitan market, and hence there is some danger of the extension of the malady to English sheep.

It behoves veterinary surgeons all over the country to be on the alert in order that an outbreak, should it occur, may be at once discovered and proper means adopted to arrest the progress of the disease.

According to the intelligence which has been from time to time received from abroad, the disease prevails extensively in Holstein and other parts, from whence we draw our principal supplies of sheep.

SCROTAL HERNIA.

Mr. Charles Joseph Whitworth, M.R.C.V.S.L., Grantham, Lincolnshire, writes in reference to this disease :—"Cases are by no means uncommon, yet vary in character.

"We have slight cases which will reduce spontaneously, those that require taxis and are reducible, others that are strangulated and irreducible, consequently require a surgical operation.

"My attention was called to a case of the latter description the early part of this season, the subject being a foal a few days old, the property of Mr. Daniel Rippon, of Barrowby, near Grantham. The hernia was of such dimensions and character that the young animal's life was in imminent danger. The foal was down in pain with accelerated breathing and great amount of irritative fever : I informed my employer that the only chance was to cut down, reduce the hernia, and castrate, by way of the covered operation, which I at once carried out, and treated the animal on general principles.

The case proceeded satisfactorily, recovered, and in a few days the foal was turned away with the mare, none the worse for the operation."

PLEURO-PNEUMONIA.

"ARGUS" writes us as follows with regard to the spread of pleuro-pneumonia:—"Observing in this month's *Veterinarian* that pleuro-pneumonia is on the increase, and that you are desirous of obtaining as much information as possible on the progress of contagious diseases, I cannot refrain from giving you a line on what has come under my immediate notice this summer. Having in June last had occasion to pass through a village in the northern division of Northamptonshire, I was informed that pleuro-pneumonia was raging in the village; my author stating that some of the affected cattle were dead, others supposed to be dying, and that the remainder of the herd, under the instructions of the local inspector, were going to a fair to be sold out.

"Now I do not know from what district you receive your reports of the increase of lung disease in cattle, but I am aware of the fact of the remainder of the affected herd here alluded to being sent to a fair in Northamptonshire last June.

"You justly remark that 'more legislation is absolutely required with regard to contagious cattle diseases,' but what is to be said with regard to those inspectors who study the feelings and pockets of individual employers in preference to the interests of the public for whose benefit they are appointed?"

Facts and Observations.

ARE THERE TWO SPECIES OF HORSE?—The researches which M. Sanson has lately carried out, and which are published in part in the 'Comptes Rendus,' tome lxvi, No. 137, have led him to the following important conclusions:—(1) There are in the East two specific types of horse, which have hitherto been confounded under the single name of Arab. (2) These are at once distinguished by their craniological character, and by the number of their vertebræ, as well as by other peculiarities. (3) They are both Brachy-

cephalic, but in one the frontal is flat, the nasal bones are rectilinear, and there are *six* lumbar, seven cervical, eighteen dorsal, and five sacral vertebræ; the other has the frontal convex, the true nasal bones slightly curvilinear, and has only *five* lumbar vertebræ, the remaining vertebræ being the same as in the first; the lumbar vertebræ are not only less in number, but have peculiarities of transverse apophyses and mode of arrangement. (4) These two Eastern types appear to have had distant geographical origins. (5) The type with six vertebræ appears to be Asiatic, whilst the other, like the ass and the zebra, with only five vertebræ, would appear to be of African origin.

Sexual Organs in Cross-bred Animals.—The character of the sexual organs in cross-breeds—animals which are the offspring of a male and female of different species—has a high interest for those who are investigating the origin of species. The subject has just been taken up by M. Arloing, of Lyons, who has made careful examination of the sexual organs of the leporides, the offspring of the hare and the rabbit. M. Arloing states that, while the offspring of the horse and ass rarely exhibit zoosperms or ova, he has found these bodies most abundant in the sexual organs of the leporides.—*Med. Times and Gaz.*

Brown's Bequest.—We should be glad to know, in the interest of pathology, that active means are being taken to administer the Brown Trust by the University of London. The whole thing seems at present to be shelved. Though an admirable scheme was most unwisely rejected by the House of Lords, yet by keeping closely to the original provisions of the will much good may be done. The Zoological Society might render very valuable assistance in the prosecution of the study of comparative pathology by placing at the disposal of the University of London the opportunity of observing phenomena of disease even during life, and certainly its effects as seen by the eye and with the microscope after death.—*Lancet.*

Trichinæ and Trichinosis.—Among the essays sent in for the French Academy's prize in experimental physiology is a memoir by M. G. Collin on Trichinæ and Trichinosis. The facts adduced are not strikingly novel. He has, however, determined a point of some interest in proving that in cold-blooded animals the trichinæ, though liberated from the cysts by the action of the gastric juice, yet never enter the blood, but are ultimately expelled through the cloaca. In

birds they may enter the blood, but they never find a resting-place in the muscles. Mammals only seem to be the "hosts" in whose muscles the trichinæ can form a suitable resting-place in which to encyst themselves.—*Med. Times and Gaz.*

Cholera Fungus.—We understand that the Director-General of the Army Medical Department and the Senate of the Army Medical School have taken an important step with a view to the final settlement of the Cholera Fungus question. Acting on the advice of the professors of the school, the authorities have consented to send two of the most distinguished *élèves* to Germany to study the subject under Professors Hallier and De Bary. The young medical officers, after mastering the mode of investigation pursued in this difficult inquiry by the eminent men above named, are to proceed to India, and to be set apart to investigate it in that great field of observation—in the very home of cholera. It is to be hoped that this well-advised measure will meet with the success it deserves. It is much to the credit of the Secretaries of State for War and India that they have consented to carry out this measure in a wise and liberal spirit.—*Lancet.*

Bacteria in the Kidneys, &c.—At the meeting of the French Academy, on May 6, a sealed packet, containing a memoir of M. Béchamp's on this subject, was opened. The author describes the presence of these organisms in the kidneys, liver, pancreas, &c., and he concludes that "it is impossible to explain the fact otherwise than by supposing spontaneous generation to have taken place."

The Tactile Corpuscles.—M. Rouget believes he has demonstrated the actual structure of these bodies, which have so often baffled anatomists. He prepares the tissues by soaking them for some time in acidulated water. He then acts on the specimens with strong nitric acid; this, he says, stains the nerve-fibres, and not the adjacent structures. Preparations made in this way lead him to believe that the nerve-fibres are not simply coiled ronnd the cone-like corpuscle, but absolutely enter its substance, and penetrate it.—*Comptes Rendus.*

Meat Preserving.—The Melbourne sheep and bullock farmers are looking with some favour on the establishment of a meat preserving company, under the impression that by this means they may get rid of their surplus meat on better terms than by merely boiling it down for tallow. For the present, Mr. Ritchie's mode of tinning meat is the one to be

carried out. £50,000 is to be the nominal capital, but it is not intended to confine operations to this mode; the company holds itself open to any, and Mr. Mort's would be preferred (says the *Sydney Mail*), were the experiments a little further advanced.—*Journal of Society of Arts.*

Annual Amount of Iron Smelted in England.—At present we smelt yearly between 4,000,000 and 5,000,000 tons of pig iron, with a consumption, on the average, of about 12,000,000 tons of coal. A portion only of this pig iron is exported, while the rest is used in part for casting, and in part for the manufacture of wrought iron and steel.

The estimated production of pig iron in the principal ironmaking countries of the world is as follows:—The figures refer to the year 1865, which is the latest date for which complete returns are obtainable:—In the United Kingdom, 613 furnaces made 4,768,000 tons; France, 430 furnaces made 1,195,000 tons; United States, 260 furnaces, 1,120,000 tons; Belgium, fifty-two furnaces, 450,000 tons; Russia, 300,000 tons; Austria, 314,000 tons; Sweden and Norway, 253 furnaces made 246,000 tons; Italy, 37,500 tons; Spain, 60,000 tons.

Mineral Oil as a Destroyer of Insects, &c.—Petroleum oil, especially in the crude state, is found in France to be of great value in destroying insects—slugs, ants, caterpillars, and other mischievous creatures. The petroleum is mixed with water, in the proportion of from an ounce to half an ounce to a pint of water in ordinary cases, but when applied to fruit trees or delicate plants the quantity of the oil is still further diminished. A very weak solution, applied to cherry trees with a watering pot, is said to be completely efficacious against the *ver blanc* or larvæ of the cockchafer. A strong solution, poured into the holes and down walls infested by insects, is said to kill them rapidly. Another application of the solution is to rid dogs and other animals of parasites, but the parts must be rubbed with soap a few minutes after the solution has been applied. An Agriculturist in the Aube says that the rats and mice with which his cellar had been infested, all quitted it when some petroleum was stored there, and that his garden was cleared of slugs by watering with the rinsings of petroleum casks.—*Journal of the Society of Arts.*

THE VETERINARIAN, SEPTEMBER 1, 1868.

Ne quid falsi dicere audeat, ne quid veri non audeat.—CICERO.

VETERINARY EDUCATION.

IN a comprehensive sense education commences in the cradle and ends in the grave; but this kind of training is not referred to when we speak of any special form of mental or physical cultivation, and in conducting an argument upon the question of the best manner of educating veterinary surgeons, it will be well to keep strictly to the point, otherwise instead of arriving at a definite understanding as to the method which is finally adapted to produce a determinate result, we shall only succeed in rendering the present confusion more hopeless. In order if possible to avoid this catastrophe, we suggested in our observations in the number for July that it should first of all be agreed whether the ultimate object of veterinary education is the obtainment of fees, or the acquirement of a true and elevating knowledge of the science of medicine. Lest we should be met by the retort that both are worthy objects of search and possible of attainment, we asserted what should be self-evident, that both cannot be at the same time paramount; either the knowledge or the money must be first in the estimation of the individual who has the choice of them; he may elect to accept both, but in all cases he will know in his own inner consciousness, and if he is honest he will say, which he pursues for the pure love of it. To put a final test which will never fail to indicate truly which of the two objects is sought as the *summum bonum* by the professional man, would he, in the words of a well-known writer, rather cure his patient and lose his fee, than gain his fee and lose his patient? This is the question which we desire to have fairly answered, not in reference to a single instance, but as the expression of a law which shall regulate all action. Again we say we are prepared to follow the argument to its conclusion on either ground.

In continuation of this subject which he proposed for discussion a short time back, Mr. Greaves in his paper on the "Question of the Day" in the current number asks the second question, and answers it in the affirmative. He decides that a sound English education coupled with the greatest amount of practical knowledge that can be given to the youth is sufficient for all purposes, and he states his case fairly up to a certain point, when he commences a style of argument that amounts to "begging the question." The remarks upon the influence of external circumstances in "forming the mind" and biassing the tastes are true enough. Men are generally what surrounding influences make them. Exceptional instances of a successful battle with fate are furnished by history, but the rule may be safely accepted in the present discussion that circumstances alter cases, and modify individual characters. The validity of the rest of the argument, relating to the technical education of the man or boy, is not so obvious. A good English education is to be given: by the time the youth has reached the age of seventeen, he is then to be sent to a veterinary surgeon for three or four years, during which time he is to learn the business, or, as Mr. Greaves puts it, to "receive a special education for his calling." The next step is for him to go to College, and having *got his diploma* he is qualified to take the management of a large veterinary establishment. At this point Mr. Greaves begins to take for granted what appears to us to be anything but self-evident. The newly qualified veterinary surgeon not only shows perfect familiarity with the routine of practice in dealing with sick and lame horses, but he treats them successfully, because he treats upon "*plain and sound principles.*"

Every word of the detailed exposition of the proceedings, manner, and aptitude of the veterinary surgeon educated upon the plan proposed fairly leads to the inference that he acts upon what he has acquired as an apprentice with his former master. It is with him and under his tuition that he has gained the "*plain and sound*" principles which enable him to treat sick horses with success; he it is who

taught him to "*see at a glance what the case is,*" and it may be safely asserted that his method of approaching a sick horse, his plan of examination, the very details of his treatment, will be as nearly as possible what he has been in the habit of practising under the direction of the veterinary surgeon with whom he was placed for the purpose of receiving the "special education for his calling." We know full well that under such a system of training the little scientific knowledge which is acquired at College is rather looked upon as obstructive than otherwise, and after the diploma is obtained, exercises but an insignificant amount of influence upon the future professional career.

Doubtless the method of education suggested is calculated to produce a certain result, viz. to make men familiar with the routine of practice, in short, to make them what are known as practical men. To an ordinary observer a young man educated in this way would appear to better advantage in the infirmary or the forge than the theorist, although he might be the gold medallist, the best anatomist, physiologist, and the most skilled microscopist of his school. The plan, therefore, has the merit of being a royal road, or a short cut rather to a position which once acquired must, or at least usually will be occupied in changeless permanence. No more hopeless state of slavery is known than that which enthrals the mind that has succumbed to the influence of routine; the state is not painful, but mentally paralysing in its effects; based upon imitation it is essentially non-progressive, and supported by prejudice it is incompatible with a spirit of inquiry; hesitation must be fatal to its very existence; to doubt is to be set free. It is not contended that a system of education based upon imitation is opposed to commercial success; on the contrary, it has been already admitted that it is capable of giving to the student a certain aptitude for business, and conferring an amount of self-possession and confidence which will favorably impress his employer even while it damages his own mental growth, but it is contended that what the student acquires under such a system cannot be dignified by the name of veterinary science—it is purely and simply the business of

doctoring horses that he learns, and as a business he may learn it well and work it successfully. If this is what we are to aim at we admit that a sound English education, coupled with the greatest amount of practical knowledge that can be given to the youth is *sufficient*, and to carry out this object fully, the first thing to be done is to re-establish the apprenticeship clause, and to shorten rather than extend the curriculum of study at the schools. To teach elementary principles of chemistry, surgery and therapeutics to a man who has had some years' practice under an established veterinary surgeon, and has made up his mind all about the medicines he intends to use for each disease to which his attention has been directed in his past practice, is familiar with symptoms, and has acquired the habit of prompt diagnosis, is a mere waste of time. Some kind of collegiate education is necessary preparatory to an examination for the indispensable diploma, but if the object is to convey the greatest amount of practical information, all the tuition should have this tendency, and the time spent in the lecture-room and laboratory would be better devoted to the business of the forge and infirmary. Mr. Greaves does not draw a flattering picture of the career which is in store for the majority of the members of the profession. Society cannot expect much from men to whom it awards £150 per annum as an average remuneration for taking care of its sick live stock; but it occurs to us that if this is one of the consequences of adopting a low standard, would it not be worth while to try the effect of a little elevation? Society might come to be ashamed of the idea of giving beggars' pay to men of high social and scientific attainments.

Review.

Quid sit pulchrum, quid turpe, quid utile, quid non.—Hor.

Principles of Organic Life. London: Robert Hardwicke, 192, Piccadilly.

Anonymous works are likely to be criticised on their merits. The halo of a great reputation does not insure for them undue commendation, nor does the name of an author unknown to fame condemn them to unmerited contempt. The work now before us presents itself without even a letter of introduction, makes no apology for its appearance without credentials, and leaves it doubtful whether it stands secure in conscious merit or in ineffable assurance. Before we have completed our task, our readers will be able to decide which of the two positions the work really occupies. At present we are content to say that the book must be either set down as arrant nonsense or welcomed as the exponent of a new system of physiology and medicine, not only different in detail from the one which is now accepted, but utterly opposed in its teaching to everything which has hitherto been considered to be true in reference to the functions of organic life, or the treatment of disease. If our anonymous author is right, every physiologist, pathologist, and therapeutist who lives or has lived is steeped in error to the crown of his head.

On the title-page we find inscribed "Gases," "Fluids," "Solids," "Principles of Organic Life;" and of these gases are evidently, in the mind of the writer, first in importance. At page 10 of the preface we get a glimpse of what awaits us in a more startling form further on.

"As, however, the gaseous vapours from the manure of the soil are absorbed by vegetation, and as plants do not possess organs for storing them, they are immediately used and disposed of. Not so with animals, for no animal who eats, digests, and absorbs is free from the defæcating process, which is the natural result; and hence we see a storing organ provided for the purpose, and being provided we cannot say that this is only a reservoir, or its contents useless, awaiting only the animal's convenience to get rid of it. It is much more than this. It answers to and corresponds with what the earth and its stores do for vegetation, and no other philosophy can exist on the subject, than that the animal is

compelled to carry its own manure about with it, the gases from which are just as useful and necessary to its existence as the gases from manure are to vegetation."

There is something astounding in the idea thus suggested, that animals are perpetually fertilizing their own systems just as an agriculturist manures his land, and that they carry about with them the necessary materials in a convenient and portable form instead of being obliged to use cumbersome machinery for the purpose of bringing it from a distance.

Fluids enter largely into the composition of organic bodies; even in the hardest tissues they predominate. The source of the supply, according to our physiology, is the blood, but to this proposition the author takes exception. He asks at page 21—

"Can the blood stand such a downright robbery? Simple common sense would at once say that it was impossible, and I will give a reason that it is so. In all arrangements where arteries go to organs, such as glands, and these organs perform their double duty, first for themselves and their own integrity, and, secondly, to make another element, the veins are large, and often show a double set, as if they carried away half as much again and often double the quantity of blood to what is sent by the arteries to these organs." Hence, the writer concludes that the blood sent to the organ cannot supply the abundance of fluid which it requires. Upon this point he remarks—

"If it were true, which physiology asserts, that all structure and secretions are made from the blood, organic as well as inorganic, what a pretty state the system would be in! The arteries, robbed of their inorganic fluid, would soon be exhausted, and we should want no veins at all."

"A great fact is, therefore, apparent on the very first inquiry into the principle of life, namely, that fluids are fabricated in the system, independently of the blood, and are not necessarily conveyed by any given set of vessels to the parts requiring them for lubricating purposes."

The source of the fluids is explained at page 35 to be the union of gases, oxygen and hydrogen, which are constantly in contact in the animal body, and the origin and importance of the gases is described in the following passage, at pages 44 and 45:

"For some years I have looked upon the colon, throughout its whole length, as the combined 'scape movement of one of the most perfect pieces of machinery that infinite wisdom could devise, without which man would not be what he is. The manure or fæces herein contained may be said to be analo-

gous to that which the agriculturist puts upon his land, for without manure he would get no crops, neither should we.

"Whatever gases are evolved elsewhere in the whole body—and I have represented them to be very large—bear no comparison to what are generated in this natural gasometer. Here the manufacturing process is so great and the gases evolved so large that they resist by their own exosmosis the presence of any other, externally generated or present in the system. Here hydrogen, sulphuretted hydrogen, phosphoric, and phosphoretted hydrogen—in fact, all the most volatile and, at the same time, useful and most poisonous gases are made. They make man himself one of the most active poison generators in the world; nor could he exist unless this was the case."

"It is to the hydrogen here generated and so readily escaping by exosmose, and permeating every structure, that we are indebted to the large quantity of inorganic lubricating fluids of the whole body. The rapid union of the hydrogens with the oxygen makes large amounts of inorganic aqueous fluids; whilst to their union and their combustion with carbon, we owe the formation of fat by inspissation. It is to the phosphoric acid gases that we owe our brain power, especially the reflecting portion. It is to the sulphuretted hydrogen we owe our immunity from eruptive diseases. It is to the combustion of all these and their prolific and wonderful union, that caloric is so largely produced, independently of any other source, and that the fluid elements of the body are maintained at a given temperature. It is to the wise laws which rule over and govern all these that make man the varied being that he is. It is to this intestine (the colon) and its contents, that the different idiosyncrasies of men are due." Again, at page 118, we read, "We have to consider man in connection with all the foregoing rules of having animal and vital life in the highest degree. Not only his capacity of consumption and his powers of storing manure in his colon; but that this manure, following the laws of his higher organism, is more highly organised itself, and richer in all those gases which make up the sum of his existence.

"Viewing all these matters from first to last, the only conclusion physiology can come to, debasing as it may appear, yet, nevertheless, true, is, that he owes all his high thoughts and aspirations, and all the wonderful efforts of his great and exalted mind—to his Fæces."

It must be borne in mind that all this is advanced in sober seriousness. The book is not intended for a satire

upon the science of physiology, but is evidently a candid statement of the writer's belief.

The consideration of the second part of the work, "Practical Medicine in its relation to Physiology," we defer to the next number; enough has been said already to arouse some odd thoughts. The subject will assume a serious or ludicrous aspect according to the idiosyncrasy,—we beg pardon, the state of the colon—of each individual.

Extracts from British and Foreign Journals.

GRESHAM LECTURES.

By E. Symes Thompson, M.D., Gresham Professor of Medicine.

ON THE DIAGNOSIS OF DISEASE.

There is a widespread notion that a doctor's mind is arranged like a dictionary, with the name of a disease on one side and that of the appropriate remedial drug on the other. It is well the public should know something of what diagnosis really is, and of the means by which we arrive at a knowledge of the nature and cause of a malady.

A precise nomenclature and classification is of immense value for systematic teaching, yet there are really but few broad barriers of separation between different diseases. The Darwinian views as to the "origin of species" hold good in pathology more largely even than in physiology, and maladies of diverse name gradate transitionally, and have much in common.

Disease means nothing more than want of ease (or, as we say, "out of sorts," "seedy," and "below the mark"), and it is a real evil to erect the name of the malady into a distinct living entity, to be attacked and destroyed by knives, lancets, and glass bottles.

There is little danger in this age of following too blindly the prescribed authority of our predecessors; our danger is, regarding the present age as the oldest and the best, to set at nought all authority and antiquity. To understand the nature of disease, we want a broad foundation. To treat disease without a knowledge of the collateral sciences on which medicine is based, is like beginning to build a "pyramid at the apex." No man can treat any one disease well who does not know the nature of the organism he is dealing with, and he who knows this best can most successfully deal with all its deviations. The attempt to specialise without having

first acquired this broad basis has a narrowing and cramping influence on the mind. The "mad-doctor" thinks every man insane—the orthopædist would put every one in irons.

Oliver Goldsmith, with his usual felicity of expression, writes: "In other countries the physician pretends to cure disorders in the lump; the same doctor who combats the gout in the toe, shall pretend to prescribe for a pain in the head; and he who at one time cures a consumption, shall at another give drugs for a dropsy. How absurd and ridiculous! This is being a jack-of-all-trades. Is the animal mechanism less complicated than a brass pin? Not less than ten different hands are required to make a pin; and shall the body be set right by a single operator? The English are sensitive to the force of this reasoning; they have, therefore, one doctor for the eyes, another for the toes, etc. . . . . The professors of other arts confess the inevitable intricacy of things, talk with doubt, and decide with hesitation; but doubting is entirely unknown in medicine. The advertising professor here delights in cases of difficulty. Be the disorder never so desperate, you find numbers in every street who, by levelling a pill at the part affected, promise a certain cure. Few of these physicians go through the ordinary course of education, but receive their knowledge of medicine by immediate inspiration from heaven. Some have spent a great part of their lives unconscious of any latent excellence, till a bankruptcy or a residence in gaol have called their miraculous powers into exertion, and thus are indebted to their superlative ignorance alone for success. The more ignorant the practitioner the less capable is he thought of deceiving. The people here judge as they do in the East, where it is thought absolutely requisite that a man should be an idiot before he pretends to be either a conjuror or a doctor."

Sir H. Holland has truly observed that a right estimate of medical evidence is a good test of sound understanding. The complexities are so various, and sources of error so numerous. It was formerly the practice for the doctor to tell the patient nothing of his ailment. Now we go to the opposite extreme, and keep nothing back, till the patient thinks he knows at least as much as the doctor, and is better qualified to treat himself. In France such is the importance attached to diagnosis that many of the most eminent physicians devote their whole attention to it, and leave the treatment to their subordinates.

The importance of having an accurate view of the nature and cause of a disease cannot be over-estimated. It is no diagnosis to say the patient is suffering from "pleurodynia

or paralysis," or that the "liver is out of order;" we must find out the nature of the deviation, and the cause too—not give a long name to cloak our ignorance, though this will satisfy the public morbid craving for names, but determine what is the real evil. People are not satisfied to be told that they have a "weak digestion," "poor blood," and "want bracing," but feel their consultation fee well spent if told, "The chylopoetic viscera are in a deteriorated condition;" that "the transformation of chyme into hæmatoglobulin is delayed;" that the "neurogenesis is pathologically, not physiologically, conducted; and that a new preparation of iron—the 'hydrosesqui-ferricyanuric acid'—will precisely neutralise the abnormality."

In many cases of dyspepsia the stomach is no more the cause of the malady than the great toe is of the gout. What has been said in the previous lecture will explain the fact that if all the force introduced into the body is used up in muscular or mental work none is available for purposes of digestion or secretion; or, again, if more food is introduced than is needed for the requirements of the body, the stomach and the blood are overcharged, and the gorged replete state called "biliousness" results, not that the "stomach is weak," as the patient thinks, but that the supply of food is in excess of the demands of the organism.

In the present day such are the aids to diagnosis, and such the improved means of investigation, that it might be supposed there could be no difficulty in ascertaining the precise nature of the deviation from health and preventing its development. For instance, much may be learnt through the eye—from the physiognomy, attitude, colour, movement, gait, bearing, etc., especially when aided by the microscope, ophthalmoscope, laryngoscope (the lecturer exhibited and illustrated the use of these instruments); through the ear—from the sound of the voice (*e.g.* as in hysteria, aneurism, cholera), of the breathing (croup, asthma), of the cough (phthisis, bronchitis, laryngitis), aided by the stethoscope, single and double; by the nose—as in rheumatic fever, small-pox, measles; by the touch—palpitation, percussion, pulse, etc., aided by thermometer, sphygmograph. Chemistry affords much help in the analysis of the blood, secretions, and structures of the body. Analysis by the spectrum is of value in estimating the length of time which various drugs remain in the body.

The lecture concluded with a reference to the application of statistics to medical questions, showing some of the difficulties in the way of collecting facts in scientific investiga-

tions, as illustrated by the statistical mare's-nest, from which a deduction had been drawn that, inasmuch as the proportionate mortality of hospitals is in excess of that of workhouse infirmaries, therefore the latter are more healthy than the former, and the attendance better—a deduction just as sound as that sitting-rooms are more healthy than bed-rooms because fewer people die in them.

HEALING OF WOUNDS BY LEAD.

The 'Journal des Connaissances Medicales' contains a paper by Dr. Burggræve, Member of the Academy of Medicine of Belgium, on the new way of dressing wounds by means of a lamina of lead, of the thickness of about half a millimetre, and which, therefore, can be easily bent by the fingers, and thus, by pressure, made to assume the form of the injured part. Once applied, it is fixed by means of strips of adhesive plaster, and once or twice a day irrigations are effected on the limb. The author of the paper states that 165 patients out of 179 treated at the civil hospital at Ghent for workshop or railway accidents, most of which were very serious, were cured without undergoing any operation, the only course followed being the treatment by lead above described. The average duration of the cure was thirty-one days and a fraction. Only fourteen, or 8 per cent., died, including those who expired a few hours after the accident, and who may consequently be considered as having been mortally wounded. For the last five years not a single operation has taken place by the knife at the Ghent Hospital in the cases alluded to. Nature alone performs the cure; all the surgeon has to do being merely to second her, and avoid the application of irritating substances. Wounds by laceration or crushing are less dangerous in their consequences than those by the knife, the vessels in the former case being contracted, and offering less chance of purulent absorption. About 50 per cent. of operations by the knife end in death, owing to the general weakness induced by loss of blood and by a strict diet. By lead treatment the patient is not deprived of his limb, and can use it, though in a mutilated state. The lead remains in its place for ten or twelve days, without any other trouble than that of making a current of fresh water pass between the lamina and the flesh, and keeping the limb in a bath. Any person, without being a surgeon, can learn to apply the lead; and this system, therefore, promises to be extremely useful on the field of battle.

ESTABLISHMENT OF AN EASTERN COUNTIES VETERINARY MEDICAL ASSOCIATION.

At a meeting of veterinary surgeons, held at the Norfolk Hotel, Norwich, on Saturday, the 8th instant, for the purpose of forming a Veterinary Medical Association in the eastern counties, the following gentlemen were present:—Messrs. W. Smith (chairman), F. Low, J. W. Riches, Norwich; E. J. King, Diss; D. E. Rattee, Hapton; H. Emms, Foulsham; E. Barker, St. Faith's; L. D. Overed, Blofield; G. K. Wake, East Dereham; D. G. Hunting, Loddon; I. Seaman, Saffron Walden; and C. Waters, Cambridge. Letters were read from Messrs. Varnell, Belton; Thorten, Ipswich; Whincop, Lowestoft; Young, Braintree; Shipley, Yarmouth; Worm, Watton; Beart, Lynn; Hammond, Bale; Coleman, Blofield; Cleveland, Wymondham; Plumbly, Skeyton; Denny, Aylsham; and Harper, Gresham, expressing regret at their inability to attend, their entire sympathy with the objects of the meeting, and their desire to become members of the association; also from Messrs. Wells and Whitwell, Norwich; and Mr. Mayes, Wymondham, declining to support the movement.

Mr. Smith then addressed the meeting, and spoke very forcibly of the past and present condition of veterinary science in this country; also of its future prospects, which he contended would be greatly influenced by the combined efforts of veterinary surgeons to advance the best interests of the profession, and in an especial manner by the formation of Veterinary Medical Associations throughout the kingdom. Their professional brethren in other parts had long since taken the initiative in this important movement, which had resulted in the formation of associations for Lancashire, Liverpool, the West of England, West of Scotland, North of England, and for the Midland Counties, which he believed were of great advantage to those who had the privilege to belong to them, by softening down animosities, removing existing prejudices, petty jealousies and distrust, adjusting differences, and making friends of those who had hitherto been strangers; besides at every meeting there is an interchange of ideas on practical and scientific subjects, which must be beneficial, as it invigorates the mind, stimulates the desire for knowledge, and teaches us that we are to live for others as well as ourselves. He thought the time had fully arrived for an association in the eastern counties, and he deeply regretted that a contrary opinion existed in the minds of three or four gentlemen, whose presence and support was very desirable; but he regretted, even more deeply, that a far greater number had not the courtesy even to reply to the circular inviting their presence to-day. In his opinion this want of unanimity amongst the members of the profession, as shown in the opposition of some and the indifference of others, ought not to deter gentlemen present, and those who, "although absent," sympathised with them in doing what

they believed to be their duty to themselves, their profession, and the public at large. He anticipated difficulties in the form of opposition, for that was invariably the case with the introduction of a new régime, whether it related to matters social, political, or religious; but to his mind we had not much to fear from honest opposition, which not unfrequently proved advantageous in the end by conducing to a more vigorous and active existence than would result from a life of continuous calm or sunshine. Our greatest danger arose from apathy and passive indifference; and although it is a humiliating fact to acknowledge, yet it is only by looking the matter fairly in the face, and dealing with facts as we find them, that we can arrive at just conclusions, and suggest a remedy by which these difficulties can be successfully met. He trusted that the existence of the Norfolk and Eastern Counties Veterinary Medical Association would date from that day forward; and if the infant was not quite so strong at its birth as we could wish, he had reason to believe that it would increase in wisdom and stature with each succeeding quarterly meeting, and ultimately become an adult and worthy scion of a worthy and honorable profession.

The meeting was also addressed by Messrs. King, Seaman, Low, and the Secretary, Mr. Seaman speaking at some length, giving a very apt and practical illustration of the value of combination amongst the members of the profession, by instancing a circumstance which occurred during the prevalence of the late cattle plague in his county (Essex), where the attempts made by the local authorities to mete out the lowest possible amount of remuneration to their inspectors were successfully resisted by them, and by unity of action, they succeeded in obtaining fair terms and an equitable scale of payment. They received a guinea for a consultation with a Government inspector, in addition to their regular pay and mileage, a like sum for a *post-mortem*, and for keeping the triplicate returns three times the sum offered. Messrs. King, Low, and the Secretary ably supported these opinions, especially the latter, who animadverted strongly and eloquently on the many instances of injustice and neglect that were inflicted on the inspectors by the local authorities in their respective districts; several of them he knew had to tender their resignations in order to obtain just and remunerative terms. These remarks were frequently applauded by the meeting, who decided in favour of the movement; and it was then resolved to form an association, to be called the Norfolk and Eastern Counties Veterinary Medical Association.

Professor Varnell, of Belton, and Mr. Thomas Greaves, of Manchester, were then unanimously elected hon. associates, and the undermentioned gentlemen officers of the association for the ensuing twelve months:

President.—William Smith, Norwich.

Vice-Presidents.—Edward J. King, Diss; Isaac Seaman, Saffron Walden; Charles Waters, Cambridge.

Treasurer.—John W. Riches, Norwich.

Hon. Secretary.—John D. Overed, Blofield.

The objects and rules of the society were next read over, and agreed upon.

The first quarterly meeting will be held at the Norfolk Hotel, Norwich, on Tuesday, October 6th, at 5 p.m., when the President will deliver an inaugural address, and Mr. Seaman has promised to read an essay on "Indigestion in Horses and Cattle."

Mr. Smith and other gentlemen returned thanks for their election to their respective offices; and, after a vote of thanks to the President for his able conduct in the chair and for convening the meeting, the company dispersed.

JOHN D. OVERED,
Hon. Sec.

NORTH OF SCOTLAND VETERINARY MEDICAL ASSOCIATION.

THE success and advantages which have hitherto resulted from the establishment and discussions of the several Veterinary Medical Associations throughout England and Scotland, and reported in the *Veterinarian,* have not been overlooked by the veterinary surgeons in the north of Scotland; and in accordance with a very generally expressed idea of the desirablenesss of such an association, a meeting of veterinary surgeons was held in the Mechanics' Hall Buildings, Aberdeen, on the 4th February last.

Professor Struthers, of Aberdeen University, presided, and briefly explained the objects contemplated, and the advantages to be anticipated from the association if rightly conducted, pointing out very clearly that the profession in this country does not stand in its true relationship to the agricultural interest.

Professors Williams, of Edinburgh, and McCall, of Glasgow, kindly consented to be present, for which the society owes a debt of gratitude to those gentlemen, whose valuable time is so largely drawn upon, but whose hearty and earnest co-operation in all that has for its aim the good of the profession deserves the approval of all true pioneers of veterinary science. Professor McCall, by request, delivered an excellent inaugural address, which was listened to with great pleasure and profit.

On the motion of Mr. Barron, Cullerlie, Mr. Dewar, Midmar, was proposed President of the society, and his election unanimously carried; Mr. Thomas Hay, Elcon, Vice-President; Mr. George Robertson, Dudwich, Elcon, Secretary; and Mr. Thomson, Aberdeen, Treasurer. The following were enrolled members of the Association:—Messrs. Simpson, Febercairn; Stewart, Rothiemay; Cassie, New Macher; Masson, Kintore; Mackie, Aberwar; Berd, Bewie; Snowball, Huntly; Tait, Portsorf; Morris, Aberdeen; Diack,

Old Meldrum; Barron, Cullerlie; Anderson, Alford; Fowlie, Tauchfield; Neil Barron, Turuff; Mellis, Inverurie; Gordon, Auchmaliddir; Duguid, Udny; Keith, Strichen; Thomson, Old Aberdeen; Duncan, Methlie; Berry, Inverurie; and J. F. S. McDouan, Loumay.

In terms of a resolve at last meeting of the society, the members met in the Mechanics' Hall Buildings, Aberdeen, on the 29th July, where, after the usual preliminary business, Mr. Dewar, the President of the Society, delivered his first introductory address; thereafter Mr. Keith, of Strichen, brought forward an essay on "Puerperal Fever in Cows," which elicited a lively discussion, especially as to the most successful mode of treatment. Professor Williams was present, and took part in the proceedings; but owing to the Highland Society's show being held at the time, it was resolved to suspend the sitting, and to continue the debate at the next meeting, which was arranged to take place in October. The subject of a charter for Scotland will be brought before the meeting. The following gentlemen were enrolled new members:—Messrs. Beattie, King Edward; Lawson, Countesswells; Taylor, Aberdeen; Grant, Fyvie; Cameron, Kincaussie; Robbie, Banchory; Machray, Udny; Symon, Forgne; Gibson, Fyvie; Tait, Elgin; Robertson, Stonehaven; Balfour, Montrose; Bell, Fraserburgh; Marnoch, Keith; Barrow, Jas. Turriff; Ogsten, Rathen; Stewart, Aberchirder; and M. Jas. McGellirrad, Rayne.

INTRODUCTORY ADDRESS.

By W. Dewar, V.S.

In appearing before you for the first time in the capacity of your President and Chairman since our association was instituted, I must beg leave to express my thanks for the unsolicited and unexpected honour you have conferred upon me in placing me here. That you have invited me to be the first President of the North of Scotland Veterinary Medical Association is, believe me, an honour and a duty which I confess I am unworthy of, and inadequate to perform, but of which I can never cease to retain a most grateful recollection.

Gentlemen, on this first occasion of our meeting I may, perhaps, with your indulgence, venture to make some few remarks introductory to the business of our meetings, more on the discharge of our professional duties than upon the pathology or treatment of disease, that we may promote the objects of our association, viz. a good and friendly understanding between us.

Gentlemen, I may say our art is in its infancy when compared with our sister science of the medical profession, although our art may date its origin from the most ancient times. It was known and cherished by the Egyptians, Greeks, and Romans. It declined in the middle ages, and was in a manner extinct; but it at length

began to revive when the severe epidemics that raged on the Continent first aroused the Governments, and taught them again to cultivate a science that had once been so useful, and to establish veterinary schools.

France nobly led the way; but it is not much over three quarters of a century since the first veterinary college was instituted in Britain.

Gentlemen, it has required the most strenuous exertions of the professors of the different veterinary institutions in our land to cause our art to be ranked as a cultivated science, and to make the veterinary surgeon respected in the eyes of the public. Our profession being of such recent origin, we must expect to find numerous difficulties to contend with—difficulties quite unknown to medical practitioners, and for which there is no remedy. They arise principally from the fact that "our patients are never our employers." They are a mercantile article, generally under the care and management of servants, who we often find have intuitively acquired along with their situation some knowledge of their diseases and treatment.

I have found in not a few instances that those in charge of horses and cattle endeavour to represent the case to suit their own purpose, and to prevent the veterinary surgeon from forming a true diagnosis of the disease. We have often a difficulty to get a true history of the case, even from the owner himself. The questions he generally puts to us first regarding a case are—"Can you effect a cure? If so, in what length of time, and at what probable cost?" If we can answer these queries to his satisfaction, well and good; but if not approved of, the patients are immediately consigned either to the shambles or the tan-yard; or I have known the animal put under the care of some quack, who is encouraged and supported by the owner, evidently to disgrace our profession.

On the other hand, we have this advantage over the medical profession, viz. that our employers generally afford us every opportunity and encouragement to promote veterinary science by means of *post-mortem* examinations and anatomical dissections—opportunities for which we have every reason to be thankful, and of which we ought always to avail ourselves, that by so doing we may improve both ourselves and the profession by aid of the unfortunate cases which occur in our practice, and thereby be more able to expose the impostures of quacks with whom we meet in the discharge of our professional duties. I have known every scheme tried by those in charge of our patients to ignore the science and character of the veterinary surgeon, that in his stead and for their own selfish ends they might more effectually prop up the empiricisms of the quack. Our agricultural periodicals have more or less of their columns devoted to instruction and consultations on veterinary science; and, gentlemen, whether for or against our profession, I shall leave to your own better judgment.

Notwithstanding the favorable encouragements and support which we receive from the agricultural community, yet in many instances we appear to be held as mere appendages to the agriculturist, when

requested to relinquish all the interests of our science to gratify the demands of a clamorous individual or party, and have tacitly to submit either to their praise or their malignity. I am aware, gentlemen, that encouragements are made to us to depart from the faithful discharge of our scientific duties to serve the unjust demands of some selfish individual or party; but, depend upon it, however little regard those individuals may have for the interests of our science, they have infinitely less for us. Should we be foolish enough to comply with their unjust wishes, these very persons would be the first to turn round and try to disgrace us in the eyes of the world.

What can we look for from the public when a gentleman like Colonel Jarvis stated in Committee of the House of Commons on the Metropolitan Foreign Cattle Market Bill, that "The Veterinary Department of the Board of Trade were rather opposed to the Bill, because they thought they would be swept away from off the face of the earth if the Bill passed." Rather a sweeping assertion from a gentleman in such a place.

It may not be far out of place to glance for a little at what the medical practitioner has to encounter with quacks and pretenders, as stated by Dr. Copland in his 'Medical Dictionary' of date 1866. He says that—

"Everywhere, in all ranks and classes, in all professions, and even among those reputed to be instructed or learned, or even imbued with science, most absurd doctrines connected with the healing art, human impossibilities, the most ridiculous notions, the most extravagant assertions, are promulgated by knavish impostors, and believed in by credulous multitudes, the impudence of the former and the faith of the latter being the greater, the more devoid of truth these doctrines are, and the more they are opposed to good sense, to true science, and to honest dealing. When we find, as may be found at the present day, in the senate, in the hierarchy, on the judicial bench, among those who govern the country, who interpret and administer the laws, who profess to direct the religious belief of the community, not merely believers in, but also propagators of, the most absurd medical doctrines and medical means—officious meddlers in what they are incapable of understanding—abettors of the knavery of mischievous quacks—can the decadence of true medical science be far off? What is neither honoured nor rewarded must necessarily cease to be sufficiently ardently and patiently cultivated. If the impertinences of the ignorant, the impudence of the vulgar, the professions of the uneducated, are to be esteemed above the acquirements of the scientific and philosophic investigator, there must at no remote period be an end of the learning and science of those who shall hereafter assume the office and rank of physician. It is very generally believed that the patronage of quacks and quackeries, of impostors and impositions, is to be imputed chiefly to ignorance; but this is only one of several sources to which it should be referred. Credulity, a tendency, even in the incredulous, to believe

in whatever is confidently asserted, a disposition to admire whatever is unknown or unexplainable, the faith which many place in the impossible—the Catholic dogma, 'Credo quia impossibile est' have collectively and severally an influence on the minds of the majority, on those who will not take the trouble of looking closely into matters or of thinking sufficiently for themselves, especially when they are either imperfectly or not at all acquainted with the natures and relations of such matters. It is not a little remarkable that since the founding of the College of Physicians at the commencement of the sixteenth century, expressly with the view of preventing the injurious and irregular medical practices of the day, down to recent times, most of the quacks and quackeries against which the college had to contend were patronised by bishops and dignitaries of the Church, and by persons of high rank, as sufficiently set forth in Goodall's 'History of the College.' It would appear at the present day as if the aberrations of the human mind, apparent in all classes and places in matters connected with the disorders of the body, were the humiliating inflictions of Providence on those to whom the professions are as a worldly craft, science as a matter of traffic, and learning an occupation of the memory, involving none of the higher manifestations of the mind. The history of human delusion as to matters medical, and of the fashions which have successively engaged the weak and selfish respecting the ailments of their debilitated frames, shows that in an era of luxurious indulgence, of exhausted vices, and of enervating enjoyments, the impudent assertions of impostors have a more powerful influence on the minds and bodies thus emasculated than the upright and rational advice of scientific and learned physicians. The victims of the former are either incapable of reasoning upon, or are too indolent to examine, the opinions and assertions which they practically adopt; and hence, of the several medical impostures of the present day, the most popular is that one which is the most extravagant in its pretensions, the most abounding in absurdity, and the most deficient in the least approach to truth. Honesty, however, is hardly praised; but dishonesty and assurance are more than praised, they are worshipped with a fervency equal to the amount of their success—a success acquired only at the expense of human suffering, and by the sacrifice of human life—but worshipped nevertheless."

From what has been read we see that, in the practice of medicine in the human subject, there are quacks and impostors to contend with in it as well as in our own profession. We need not, therefore, be surprised to find quackery supported and science censured. Our patients are dumb animals, and cannot tell the suffering or the cruelty inflicted upon them by these "known ones." In my own opinion, gentlemen, from what I have seen in the course of my practice, there would appear to be as much cruelty inflicted upon the lower animals in our own nation, from ignorance and barbarity, as there is by all the vivisectors in the French empire. But, gentlemen, I need not dwell longer on quackery and its votaries; they are to be met with in everyday life. Let our object be to guard

against practising it ourselves, and to prevent its inroads through others.

I would say, gentlemen, that as we are all of one profession, let us all be professionally united with one mind to promote and protect whatever may seem to further the different branches and interests of our profession. Let the world see that our art is based and built upon science which every assailant will find impregnable. Our profession, if worthy of being called by the name, demands from its practitioners more care and protection than one of more mature years, which has been nursed and cherished by its professors and practitioners for centuries. Let us be worthy of the calling we have espoused, and be united together in all that promotes the perfecting of our profession. Let it be governed and cultivated by those who are professors and practitioners of the veterinary art, who alone know how to shield it with the mantle of science, and to protect it from the chilling blasts which threaten its destruction. Let us apply to it that culture necessary for its growth and stability, that by its luxuriance it may check and destroy every noxious weed which may obstruct its progress. Let us put shoulder to shoulder, and unanimously support every tender branch of our science, that we may the more effectually maintain and elevate the social standing of our profession.

I may be allowed to mention, gentlemen, that there are, and probably ever will be, both in the medical profession and in our own, contagionists and non-contagionists; but whatever our differences of opinion may be as regards contagion, let us be all harmonious in freely discussing and making ourselves acquainted with the nature and character of any epizootic which may appear to be approaching our country, in order that, by our united efforts, we may both enlighten ourselves and our profession, and be the better able to protect our country from its ravages.

I would trust, gentlemen, that the formation of this association will mark a new era in the history of veterinary science in the north of Scotland; that by reading and discussing subjects upon the pathology and treatment of the different diseases of our domestic animals which we meet with in practice, we will both conduct and exert ourselves to the utmost of our ability to bring our profession to greater perfection than it has yet attained.

MILK FEVER IN COWS.

By Mr. Keith, of Strichen.

In describing this subject I shall observe the following order:

Causes.—A peculiarity of constitution favorable to milk giving, high condition, especially when recently acquired, rich and nutritious diet given too liberally, the parturition period, the neglect of necessary milking at such times, and the season of the year, with early summer, and warm weather, and rich pastures.

Its definition.—As before noticed, the disease is one affecting

cows immediately before, at, or shortly after calving; those in high condition and favorably known to the dairymaid are more particularly the subjects. Such facts help us to a resolution of its name and nature; it is known by the synonyms, if I may call them so, of parturient fever, puerperal fever, milk fever, and parturition apoplexy, besides a host of such provincialisms as dropping after calving, loin fallen, &c. That of milk fever I am inclined to favour as the more correct, the imperfect secretion of the lactic fluid and the retention of its constituents in the blood being evidently the cause of disturbance. Its occurrence at or generally near the time of calving would be attributable to an arrest of or an imperfect diversion of the circulation, carrying, as it must needs do at such a time a very large amount of those constituents which in the gestating period had been so wondrously eliminated, prepared for the development of an organized existence through the medium of the uterus, and which have now to be determined to the mammæ, by its function elaborated into milk for the further and fuller development of the separated fœtus.

The retention of so much plastic material in the blood would not only interfere with and produce a languor of circulation, but also affect the nervous system, either by its defective supply or vitiated quality; from such conditions, I would conceive, are developed those phenomena we recognise as the symptoms of this disease.

Symptoms.—These are so well marked and so well known that I need notice only the more prominent. Generally within twenty-four hours after parturition, sometimes previous to, and in one case so much as fourteen days before, have I observed the following in order:—A perceptible dulness, heavy eyes, peculiar motion in the abdomen as of sickness, increase of external warmth; pulse full, soft, and tardy; the secretion of milk not corresponding to the appearance of mammæ, the temperature of which not exceeding that of the body. Following upon these, after, it may be, an interval of from one to twenty-four hours, the disturbance of nervous system increases from slight impair of sense and motive power on to that of complete prostration, during which delirium of the typhoid form is almost always present, the secretion of milk all but or wholly suspended; the teats, mammæ, and body, are reduced in temperature, more especially the extremities, which are frequently icy cold, every function over which the will has control being in abeyance. The heart beats regularly, but slowly. The breathing is slow and stertorous. A ropy foam is often discharged from the mouth, and a glutinous secretion from the uterus. The eyes are fixed and glassy; the ears hang, and nose protrudes distended; the animal lies extended in a death-like sleep. Many more specialities I might include, but I shall have to refer to these in discussion of treatment.

Treatment must be dependent upon the idea held as to nature of disease, and regulated by the state or stage in which we find the patient.

My practice, I need not tell you, is entirely referable to, and, I

believe, rationally and naturally deducible from the fore-given opinion and the evident dictations of *nature* in the direction of cure. There is no prostration of either nervous or physical power from previous exertion.

Seldom or ever does it follow difficult parturition, but is the sequel to an easy and languid case. Accepting, then, that the condition is referable to a circulation vitiated by excess, or an altered state of some of its constituents, our attempts will be by every rational means to excite elimination by their natural channels and thereby restore the healthy balance. To some extent this may be accomplished by warmth and friction applied to the mammæ and the neighbourhood of the supplying vessels, the secretion to be removed as collected. The bath by large cloths and warm water enveloping the whole abdomen I believe to be the most effective for this purpose; besides that, its tendency so applied would be to soothe the nervous system and expedite the attainment of next agency. My experience in observing the natural development of the disease *or its "cure,"* would point to sleep as the great restorer, and for this purpose would prescribe a full dose of Cal. et Opii with linseed oil, the Cal. not only acting along with the Opii as a sedative, but influencing the secretion of the mammary and other dominating organs, by procuring sleep or a tranquil condition like it. We cut short the period of delirium, a most important object, as during its continuance and resulting from the exertions made, the fatal issue is generally determined, apoplexy being in most cases the cause of death, and during some delirious paroxysm no doubt the lesion occurs. The oil I give more to anticipate the action of the opium on the bowels than to expedite or excite their present dormancy, no action being ever induced until some progress has been made otherwise in the way of cure; and in no case when treated as before advised have I found the bowels to be other than normal, when returning function admitted of their action. The treatment presupposes a stage prior to that of complete prostration, when the attempt to administer any medicine would be as unsafe as an uncalled-for proceeding, result being only mischief either in the shape of disturbance or choking—this last a very likely and a very common termination. At this stage it is best to content ourselves with *expectancy*, enjoining the utmost quiet on the attendant, and a perseverance in the efforts to excite the milk secretion, no visitor save plenty of fresh air being allowed. Prognosis favourable, the per-centage of deaths for ten years under prescribed treatment not exceeding one in twelve, and highly favorable when the constitution is good, the flow of milk not entirely suspended, the season spring, the temperature not too high nor the food too liberal or nutritious, no previous attack, nor the disease too far advanced when called to treat.

The terminations, 1st, are recovery rapid and complete, the convalescence being expedited by a liberal supply of good tea. "This beverage I have found very serviceable and much relished in the first stages of disease." The sequel of inflammation of the lungs

occasionally follow this recovery, and must be treated as for that disease. 2nd. Recovery gradual and incomplete, when tonics and sometimes strychnine is required ; and 3rd. Death, which generally occurs before forty-eight hours, the only interest attached to which is the opportunity afforded for a post-mortem examination, which in cases treated as I have indicated (without the microscope or the aid of chemistry), reveal but little disorganisation (unless what may have existed prior to and independent of this disease).

Most of the internal viscera, especially the abdominal, will present a state of congestion with no change of structure, the contents of the stomachs and intestines generally normal, the membranes of the brain and cord highly congested, and a lesion at the base of the cerebellum all but a constant circumstance.

When drastic purgatives have been given another series of phenomena are present, such as intestinal and uterine inflammation, frequently that of the lungs, probably from the defective swallowing of the drench.

As this department of the subject, in my opinion, can only satisfactorily be discussed by the patient microscopist, the disease being primarily and particularly of the blood, I shall only allude to it, in the hope that the proposition or the discussion arising from it may be the means of leading to the necessary inquiry; and last, yet not least, is a division of this subject most worthy our attention.

Prophylaxis or the preventive measures to be used.—When the animal, season, or diet, is suspicious, previous to calving, allow only a very spare diet, fresh but poor ; keep clean, airy, and comfortable ; when there is so great appearance of milk as to give any discomfort, draw off as often and as much as may be sufficient to relieve. After calving, for some days continue the same diet and regimen, milk clean and regularly every four hours, unless when suckling, when the milking at like intervals may only be partial.

YORKSHIRE VETERINARY MEDICAL SOCIETY.

The usual Quarterly Meeting was held at the Swan Hotel, Harrogate, on Monday, the 3rd August, the President, Mr. Charles Secker, in the chair ; there were also present, Messrs. McTaggart, Naylor, James Freeman, Joseph Freeman, Godfrey Smith, Benjamin Smith, Bale, Anderton, Howell, Pratt, Dray, Cuthbert, and Broughton.

Letters of apology for non-attendance were received from Messrs. Greaves, John Freeman, Fallding, Lord, Schofield, Patterson, Kirk, Bourdass, Fearnley, and Nicholson.

The minutes of the last meeting were read and confirmed.

Mr. John Faulkner, M.R.C.V.S., Wetherby, was elected a member.

A member who had unwarrantably insulted the Hon. Treasurer when applied to for his arrears of subscription, was unanimously censured, and his name ordered to be expunged from the list of members.

The consideration of Mr. Freeman's motion relative to the alteration of Rule 11 for the Regulation of the Society's Meetings, was referred until the annual meeting.

Mr. Godfrey Smith read his paper upon "Pneumonia in Cattle," stating that during the spring months of the present year this affection had prevailed to an unusual extent in his practice; in fact, the prevalence of the disease had almost assumed the appearance of a local epizootic.

The causes of the affection were not very apparent, but doubtless the exceedingly hot days and chilly nights were an exciting cause; the symptoms differed in no way from those usually present in pneumonia, the absence of the particular cough and grunt characteristic of pleuro-pneumonia sufficed to distinguish it from that disease; its non-communicability was also a distinguishing feature.

Pneumonia proper being a very rare disease in this country, several of the members present were rather of opinion that Mr. Smith had mistaken the disease, pleuro-pneumonia, for pneumonia; but *Mr. Smith* asserted that in the small number of cases which had died, the *post-mortem* appearances fully bore out his pathological conclusions. In the course of an animated discussion, the whole of the members took part.

The next meeting of the society will be held at Halifax in October, when Mr. W. Fearnley, of Leeds, will read a paper.

Wm. Broughton, *Hon. Sec.*

NORTH OF ENGLAND VETERINARY MEDICAL ASSOCIATION.

The nineteenth Quarterly Meeting of this Society was held at Grey's Adelphi Hotel, Clayton Street, on Friday, July 17th. Present: Messrs. C. Hunting (President), D. Dudgeon, J. Meikle, R. Brydon, Wm. Marshall, W. Hunting, J. Thompson, C. Stephenson, and H. Hunter, Hon. Sec.

The minutes of the preceeding meeting were read and confirmed.

A letter was read from Mr. H. Peele, Hartlepool, stating his inability to attend.

The Secretary also read a letter which he had received from Mr. John D. Overed, M.R.C.V.S., Blofield, Norfolk, asking for a copy of the rules of the Association, as an effort was about to be made to form a Veterinary Society in the eastern counties. A copy of the rules was forwarded as requested. The chairman and members

also expressed their satisfaction with the movement, which they trusted would prove successful.

It was proposed by *Mr. Meikle* and seconded by *Mr. Hunter* that Mr. Waller Wilkinson be a member of the Association. Carried unanimously.

Mr. J. Meikle then read his paper on the disease, commonly known as "Red Water in Cattle." This essay was well received, and led to a long and interesting discussion in which most of the members took part.

At the close of the discussion it was proposed by *Mr. Dudgeon* and seconded by *Mr. Brydon* that a vote of thanks be given to *Mr. Meikle* for his able and instructive paper. The motion was supported by *Mr. C. Hunting* and carried unanimously.

The proceedings were closed with a vote of thanks to the President.

HENRY HUNTER, *Hon. Sec.*

LIVERPOOL VETERINARY MEDICAL ASSOCIATION.

THE seventeenth Quarterly Meeting was held at the Medical Institution Hope Street, Liverpool, on Friday the 14th of August, Mr. J. Heyes, president, in the chair. The following gentlemen were also present:—Messrs. Morgan, Wilson, Akroyd, Proctor, Reynolds, and Hanwood, Liverpool; Storrar, Chester; Greaves, Manchester; and Greaves, jun., Altringham; Duck, Wood, Wigan; Whittle, Worsley; Cartwright, Whitchurch; Dobie, Birkenhead; Roberts, Oswestry; Barton, Tarporley, and the Secretary.

After the minutes and other matters in connection with the association had been passed, the Secretary read the following letter from Mr. Overed to Mr. Greaves, relative to the formation of a Veterinary Medical Association for the eastern counties.

BLOFIELD, near NORWICH;
August 13*th*, 1868.

MY DEAR SIR,—Permit me first to thank you for copy of rules, and especially for your most welcome letter of the 10th ult. I exceedingly regret to find that the Veterinary Medical Associations in other parts of the country are losing favour with the bulk of the members, and especially when men of the first ability and the highest practical and scientific attainments take such an active interest in their success. But so it is those who possess privileges which others sigh for in vain, are indifferent to and utterly regardless of them; to such men they are valueless, because unappreciated and unimproved; for these there is but little hope. Of what

use, I would ask, is it for such men to appeal to the legislature or to any other quarter for help when they are far too indolent to help themselves, and to grasp privileges placed within their reach. When I think on these things I almost despair of the future as regards the veterinary profession. Verily, as the editor in this month's *Veterinarian* justly remarks, "Were it not for a few patriotic members amongst us, we should utterly stagnate." To those members we owe whatever of vitality, of honour, and scientific knowledge we possess, and it is to them alone we must look for future advances in the cause of veterinary science and practice. As a humble member of the body corporate, how have I longed to see our profession advancing to occupy its legitimate position by the side of the sister sciences, and watched with eager eye every movement upward; at present the attainment of this object appears very remote, and one is at times tempted to believe that it is not within the range of possibilities, but be that as it may, I trust that those who labour for it will not relax their efforts, which, if not appreciated by their professional brethren as a whole, are yet approved by many amongst them, and by their own consciences as having done what they could. I fear, sir, that in pursuing this subject I am presuming too much upon your patience, and at the same time losing sight of the chief import of my note, viz., to inform you that the preliminary meeting of veterinary surgeons was held on Saturday last, and resulted in the formation of a Veterinary Medical Association for Norfolk and the Eastern counties. There were twelve individuals present, and promises of support from about an equal number, some four or five were against the movement, and more than forty to whom circulars were sent did not even deign to reply. The first quarterly meeting will be held at the Norfolk Hotel, Norwich, on Tuesday, 6th October next, at 5 p.m., when the president Mr. Smith will deliver an inaugural address, and Mr. Seaman has promised to read an essay on Indigestion in the Horse and Cattle, when, if convenient, we shall feel proud to have the honour of your company amongst us. I beg also to inform you that the meeting, to mark its sense of your constant efforts in the cause of veterinary science, and the great benefits arising therefrom, did themselves the honour to elect you and Professor Varnell Honorary Associates of the Association. A brief notice of the proceedings will be forwarded to the editors of the *Veterinarian* for insertion in the next issue, and a circular issued concerning the meeting for October, one of which will be sent to Manchester, with compliments.

Believe me,
Dear Sir,
Yours very faithfully,
JOHN D. OVERED, *Hon. Sec.*

Thos. Greaves, Esq., Manchester.

Messrs. Tom Taylor, Manchester, and Tom Roberts, Oswestry, having been proposed and seconded as members, were unanimously elected:

Mr. W. A. Cartwright, Whitchurch, was nominated an Honorary Associate, and Mr. Akroyd, Liverpool, as a member.

The *President* then called upon *Mr. Tom Roberts* to read his paper on "Tetanus," which he did, as also a letter relative to a case which he successfully treated with hydrocyanic acid.

Oswestry; *Aug.* 13*th.*

Mr. President and Gentlemen,—I appear here before you this evening with considerable diffidence, because I am under the impression that, owing to the notice issued by our worthy secretary, some of you may be induced to expect a very interesting communication. It was at the time of unusual interest to me, because my patient, a very fine horse valued at 300 guineas, had shown symptoms of tetanus some nine or ten days before I was called in to see him, and only came home the evening before by rail from Yorkshire, and had been ridden two or three times with hounds after the first symptoms had set in.

As my client has written a detailed history of the case, I really think it would be as well for me to read his letter, inasmuch as he watched the horse narrowly throughout, until I was called in by the coachman, who said that the horse had inflammation of the lungs, and had not lain down for a week. Mr. Longueville thus writes:

Penyllan, Oswestry;
April, 23*rd*, 1868.

Dear Mr. Roberts,—In answer to your inquiries as to when my bay horse first showed symptoms of indisposition, I beg to say that he was brought over to Badsworth, where I was staying on Thursday, February 6th. On the Friday the groom noticed his eating in a peculiar way, and said that he had the appearance of a horse attacked by lockjaw. The only injury to which I could attribute this was a very trifling overreach which the horse had received upon the previous Friday. It was a mere rub and had quite healed. The horse fed well at night and the next morning seemed much better, and the groom noticing that his teeth were rather worn, he thought that they were probably the cause of his eating in a peculiar manner, and as he seemed perfectly well in other respects I took him out hunting (this was Saturday), and he carried me as well as he ever did. There was no change of symptoms until the Tuesday, and as he fed, &c., very well, we gave up all idea of his having lockjaw. On Tuesday I hunted him.

I noticed that he blew a great deal and feared that his wind was affected. Otherwise he seemed in good health. He did not seem tired after his day and fed well. The only thing I noticed in him on the following days was, that he seemed stiff when turning in his stall, and I also found out that he had never lain down since he had arrived, but this I immediately accounted for by his being invariably kept in a large loose box at home, and being in a stall here. On the Saturday I again hunted him. The hounds found in a gorse cover and ran for ten minutes like the wind. I managed to keep a

good place throughout, but the pace was very severe, and at the end of the ten minutes my horse seemed very much distressed, and I took him home. On the Sunday he looked dead amiss, and on the Monday I brought him home. He had to be ridden seven miles to Wakefield station, and then had an eight hours' railway journey.

All this time, at least since Saturday week, I had made up my mind that the horse had *not* got lockjaw, and on the Tuesday you came to see the horse at my request, expecting, as I had told you, to have to treat the horse for either influenza or roaring. What follows you best know. I have to thank you for rescuing a very valuable horse for me from the very jaws of death. He is looking to-day the very picture of health.

I remain, yours truly,

T. LONGUEVILLE.

You all know the symptoms of tetanus, and in this case they were all strongly marked, being as distressing as any I ever saw.

I gave him a draught containing a pint, Linseed Oil, Spt. Nit. Æther ℥ij., Tinct. Opii. ℥j. Leaving him locked up, with the key in my own pocket, I left strict injunctions that no one was to see him nor approach his door until I returned the following morning, when I gave him his first dose of prussic acid in half drachm doses; this I continued to do morning and evening for about a fortnight, when I increased the dose to a drachm. During this period, no one was allowed to enter his box except at the time he was having his medicine, when also his linseed mashes were renewed, and it is to this mode of treatment or rather you may say *non*-treatment that I attribute the successful issue of the case.

To show the absolute necessity of quietude and repose, my patient was doing very well at the end of the third week, being able to work his jaws a little. His master was so proud of his recovery that he took in a friend to show him. They opened the door rather too hastily, the horse was so startled (possibly he may have been dozing off to sleep), however, he was that terrified that the tetanic spasms immediately returned in all their severity. I then had my patient in exactly the same state I found him at first, and had all the trouble of another three weeks' treatment.

My method of administering the acid is as my esteemed old master Mr. Lawson, in Chester, taught us in his infirmary, viz., with a small tube, and *not* as Mr. Wilson and Mr. Owles have directed in the *Veterinarian* for last April in their water and mashes.

Gentlemen, I beg to thank you most sincerely for the privilege of being one of your members, and for your patience with my reading these few simple facts.

After the reading of this case, a spirited discussion took place on the subject, the main points being as follows: *Mr. Reynolds* preferred giving the acid in enema, as he thought it would evaporate in mashes or water, and it would not excite the animal

so much, which remarks were confirmed by *Mr. Storrar*, who attributed recovery in majority of cases to quietude, and considered the chances of recovery much better when the attack came on slowly; and in answer to *Mr. Wood* whether it was not unusual for it to do so, said that he had had several cases that had been eight or ten days amiss before a V. S. was called in. *Mr. Heyes* mentioned the case of a mare, which having been turned out fell into a ditch, and after remaining there all night was extricated, but with a slight attack of tetanus as the result. He treated her with perfect quietude, but a surgeon happening to come in expressed his surprise at such treatment and gave turpentine and enemas, under which usage the mare succumbed the following morning.

Mr. Wilson spoke of the benefit of the hydrocyanic acid treatment with quietude, and called attention to his article in the *Veterinarian* for April, 1868, which article the secretary read to the meeting.

Mr. Proctor related the case of a pony, to which he administered a dose of croton oil, and then kept it perfectly quiet. Ultimately it recovered, although it had been ill some days before he was called in, and the trismus was so perfect that medicine could not be administered. He had a roan horse at present under his charge which he was treating the same way. He expressed his belief that animals would recover as frequently without medicine as with it, but on the whole he preferred hydrocyanic acid and perfect quietude.

Mr. Greaves agreed with these remarks, and stated that Mr. Broad, of Bath, never administered medicine, and yet was very successful in these cases. He preferred administering medicine by the mouth as the animal would die if unduly excited. He thought there was great danger from an animal getting down, and recommended that slings be used, putting them on carefully and not too tight. He thought if the patient lived over fourteen days, it was tolerably safe. He considered purging was very bad treatment.

Mr. Storrar, *Mr. Roberts*, and *Mr. Dobie*, each advocated slinging, especially when the muscles began to relax.

Mr. Reynolds adduced an instance of an animal having paralysis of the hind extremities after tetanus. It had been treated with hydrocyanic acid, and to the effects of this drug he attributed the palsy. This *Mr. Greaves* controverted, as he thought paralysis was a natural consequence of the disease, as its seat was in the spine, the lumbar region being especially affected; and he had found that portion of it in autopsy softened and in a semi-fluid state for eight or ten inches; and in answer to *Mr. Reynolds* as to whether this might not be due to exalted function or sometimes inflammation, he said he was not exactly prepared to answer that question, but he believed that inflammation in a greater or less degree was present in some stage or other of the disease.

Mr. Proctor agreed with Mr. Greaves as to the post-mortem appearances, and stated that he omitted to mention when speaking of treatment that he always gave large quantities of chloride of sodium.

The Secretary asked if any gentleman had used tobacco as a remedy for this disease, as he knew one practitioner who had great repute for this mode of treatment, giving it in infusion by means of the male catheter and a funnel.

Mr. Morgan then proposed a vote of thanks to Mr. Roberts for his paper and for having come such a distance to read it; *Mr. Greaves* seconded it, and after *Mr. Roberts* had returned thanks,

The President called upon *Mr. Walley* for his paper.

Mr. President and Gentlemen,—The question of the day, amongst the members comprising the body of the Veterinary profession is *Education*, and perhaps there is not one individual present here to-night who will not agree with me in saying that it is one of vital importance not only to ourselves, but to those who shall hereafter walk in our steps, for as we educate those who are entrusted to our care, whether as our own sons or as pupils, so will be the amount of our pleasure (if it pleases the Almighty Ruler of all things to give us life for so long), hereafter to see them growing up around us honoured and revered by those older than themselves, and useful members of the society they may move in, so much more will be their thanks and gratitude to us for the trouble and pains we have taken in educating them; so much more will they feel themselves in duty bound to impart all the knowledge they can in their turn to those whom they may have to initiate into the secrets, and scientific and practical mysteries of our profession. In the leading article for July in the *Veterinarian* there is a question asked very pertinent to the matter I am considering, viz., whether we are to educate the youth of our body with the view of making them love their profession and work heartily in it for its own sake, or with the view of making it a commercial transaction, and working in it solely to make as much money as they possibly can. Now, though these are two separate questions yet they so glide one into the other that, like Jeremy Taylor's description of a husband and wife, none can truly say which rules, or is predominant; one should not be made subservient to the other, but each should have its due share of thought and attentive care bestowed upon it. To go to the extreme in either question would simply be a great mistake; bring a youth up solely in the love of a profession for the profession's sake, and he will let that thought swamp the equally weighty matter of providing for those who may be dependent upon him for support. What is the aim and object of every living worker on our globe at the present moment? To provide the comforts and necessaries of life for himself and those who may share his hopes and aspirations. However much a man may give up his time and attention to the consideration and advancement of any particular matter (unless he be provided from other sources), the one grand question will inevitably rise in his mind, What profit am I to gain from this thing? will its consideration provide me with the means of obtaining bodily sustenance as well as of food for my mind? Education is undoubtedly a great blessing to mankind when a

proper use is made of it, but it becomes a great and subtle curse when imperfectly used. What has education done for the great mass of our artisans? Made them use it as a handle for extorting more money from their employers by means of strikes and such like deplorable and questionable practices, and the higher you go in the scale the greater refinement of thought you will find brought to bear upon these means to the obtainment of an end; who are the first to strike but those who have the most subtle minds to guide them, and the greatest amount of education to steer them? Who are the last? those who are in the lowest state of education; the farm labourer is seldom heard of joining with his brother labourer to wrench more money from the pockets of those by whom he obtains his bread. What are you and I suffering from at the present moment but from the high rate of wages which robs us of all the profit we can ever attain by our forges? The country smith is content to toil the live-long day for his scanty pittance, knowing and feeling content in his ignorance that he who employs him has to obtain his bread and cheese out of his work as well as himself.

What is it that makes the steward and bailiff, manager, or agent, extort his commission from those with whom he may deal, but education, teaching him that from such an one he can, by putting on the screw, obtain so much more than he can from another. What is it that makes the sub-agent, the butler, the coachman, the gardener, look respectively for his five to ten per cent. off every transaction of which he may have the management, but education? These are, doubtless, instances of education misused, but it is just so much the more increasing the guilt and condemnation attachable to such conduct; had they remained ignorant the guilt and connivance of doing wrong could not be imputed to them.

But how much more guilty those who with superior education use it to pander to the vices and follies of those lower in the social scale their seared consciences shall one day truly and in unmistakeable language tell them.

It is unfortunately too true in the present day that if a man wants to make himself popular in the business or calling he may have chosen, except indeed in the higher branches of science, art, and profession, he has nothing to do but hold out the hand of fellowship to the servants of those amongst whom he may be living and satisfy their craving greed of gold and indulgence, and he will most assuredly succeed to his heart's content, except in some localities and instances where such influences, by the force of circumstances, cannot be brought to bear, and here and there will the man of talent, observation, and worth rise to his just level, and the labour which he has bestowed upon his education, professional or otherwise, meet with its just acknowledgment and return; and let us reflect what kind of education it is we should give to our sons and pupils. The latter is more easy of solution than the former; for when he is settled down in the pursuit of a particular branch of study the student insensibly becomes influenced by that particular

study, and led on to the appreciation of its importance, and to the necessity of educating himself thoroughly in its tenets, but with the former it is a different thing. We cannot tell what particular calling or pursuit he may follow in his after-life; we may design him for this or that, but there are many things that may happen to prevent us carrying out our designs; hence it behoves us to be more careful in determining as to how much or how little education we shall give him. And let us remember too that it is not the teacher that can give the taught the name he will inevitably bear in his after career; you may call him what you like, and let his name have an allusion to any particular virtue you like, but it lies with himself as to what name he shall bear when the lapse of years, and fading mortality shall call him to account. Hence the greater necessity of teaching him to rely upon his own resources in whatsoever condition or state of life he may find himself placed, and hence the necessity of enforcing or impressing upon his mind the value of gleaning as much knowledge as he possibly can whilst he has the opportunity so to do, but let us also be careful as to the kind and degree of knowledge we would store his mind with (no matter how much a boy or a man knows as long as it is good, healthy, useful knowledge), with a due regard to the way in which he should conduct himself in his whole training and intercourse in society, and if we only teach our pupils how to make and keep money they will imbibe the task with great alacrity, and if they live they will see the ground they have chosen for themselves, growing over and around them as quickly as the most ardent seeker of gold could wish; but let them beware and reflect oftimes when they are exceeding glad of their gourd, that there is a worm at its root, and the possession of it may not, after all, give them so much joy as they had anticipated. If we bring up our pupils with a due regard to the noble nature of the profession they have chosen (for, undoubtedly, its nature is in itself noble) they will grow up to love it, and try earnestly and perseveringly to make themselves no unworthy masters and practitioners of its science and art.

With regard to the more intrinsic part of our inquiry, viz., How shall we educate our pupils? allow me to give you a brief outline of my own ideas upon the subject. Supposing, then, we have a youth placed in our hands to be educated as a Veterinary Surgeon, who is possessed of an ordinary amount of learning, that is with a good sound English education,—and I need not tell *you*, gentlemen, what I mean by that expression; but there is one particular branch of learning that I would call your attention to, viz. *Latin;* this will frequently be of great help to the student, especially in enabling him to understand anatomical terms; and in other branches of his studies too, neither will the knowledge of mechanics be thrown away upon him—let us first try to find out what materials we have to work upon; what are his capabilities, his aspirations; and then, if he have a medium degree of mental capacity, let us show him the magnitude of the task he has undertaken, and he will rise superior to the occasion and deter-

mine to conquer or to die; let us show him plainly the objects and aims we have in view for the future of our profession, the battles that have to be fought and won before it can rise to its place amongst the professions of our land; let us instil freely into him the first principles of his undertaking; let us make him acquainted practically with the state of animals in nature and then he will the better be enabled to detect and appreciate the presence of disease; let us thoroughly acquaint him with all the little natural phenomena we constantly meet with amongst our patients, and always impress upon his mind the necessity of never ridiculing or spurning anything that he may hear, no matter how foolish and unworthy it may appear of credence at the time; let him hear and say nothing (for out of the mouths of babes cometh wisdom), and by so doing he will never make foolish remarks himself before his employers in after times. I once heard a farrier say when called upon to attend a cow suffering from paralysis after calving, "Oh, Mr. Walley, she'll do no good, for her tongue 's gone quite black," which said blackness was caused by a patch of dark-coloured skin on the surface of the tongue, and which blackness remained there as long as I knew the cow; and I knew a V.S. once go into a shippon and looking at a cow, and finding her hair at the back of her shoulder a bit rough, nodded his head wisely, and exclaimed, "Ah, she is in a very bad state indeed, her coat is sticking up all on end," for which piece of information he was solemnly put down by the hind as an ignorant fop. Then, I say, to avoid such occurrences let us educate our pupil in the A, B, C of his calling; it is no disgrace to him that he should get out of his bed in a morning and roll up his sleeves and have a turn at making the horses' skins that may happen to be in the stable a little brighter, and learn that cleanliness will help to keep the horse in health; by so doing he need not by any means let himself down to the level of the horse's attendants; let him take his book when work is not pressing and stroll with it into some neighbouring pasture where he knows cattle are grazing or sheep are feeding, and carefully study their habits, the different ways of gathering their food, of chewing their cud, of reclining, of voiding their excretions, and of their general deportment; he will not find this lost time. Let him perfect himself in all the meaner and minor operations of his profession, how to handle a horse or a cow, how to secure them to administer medicines, or to perform operations, and how to administer medicines in the most practical and easy manner; and when in the presence of a case of sickness, bid him find out what organ or organs of the body are thrown out of working gear, what the cause or causes of such effects, and he will have some clue to their removal—how he would set about restoring the animal to health; having previously initiated him into the mysteries of the pulse, respiration, colour of the membranes, &c., let him point out which of them are at fault, and impress upon him at the same time the necessity of hygienic measures, with the why and the wherefore of their influence upon the sick frame; and when we have administered or ordered such

medicines as we think necessary, let us, whilst wending our way onwards, fix the case or cases upon his memory, by relating others to him of a similar nature that we may have had under our notice; and when arrived at home, let him draw out a short and succinct account of all the cases he has seen—the causes, symptoms, treatment, &c.—it will not only assist his memory, but be there as a guide for the future; let him also consult such works as he may have in his possession at the time upon the several subjects, and see what is therein stated with reference to them; let us teach him the rudiments of anatomy, physiology, chemistry, pathology, &c., and the relation that one part of the body bears to another, the solids to the fluids, and the fluids to the solids, and thus will be rendered more easy the task which he will have to perform before he earns the title of M.R.C.V.S.; let us teach him diligently to search and inquire into the modes of the propagation of disease; and as he goes on, let us teach him somewhat of the nature of the several foods our patients live upon, the components of the soil whence they are extracted, the presence or absence of any deleterious substances that could possibly affect health, whether vegetable, mineral, or gaseous, in the air, earth, food, or water; let us as we proceed teach him somewhat of botany, geology, the effects of atmospheric influences on the animal frame, and numerous other little things that it is impossible for me here to mention; let us be patient and careful with him, showing him by our own conduct that we would have him believe in and make use of all we teach him. We need not entertain him with any lengthy or learned dissertations upon the several subjects I have here mentioned, but show him wherein, and how, they practically and visibly bear upon the various phases of the profession he has chosen; let us teach him—and endeavour to find out ourselves—why this particular locality engenders red water, this braxy, this rot, this filaria, and, in fact, all the species of entozoa; this scab, this splenic apoplexy, this parturient apoplexy, this hæmastasia, this hæmatazymosis, this cancerous affection, this influenza, this distemper in the dog. Let us, in short, impress upon him the value of finding out little causes that may be in operation to affect the health of our several patients, and he will hereafter be the more able to cope with greater causes and effects when they shall come across his path; and when a sudden outbreak of any fatal affection takes place in the neighbourhood in which he may be located; teach him not to waste his energies in uselessly trying to fathom the mysteries of Omnipotence—when after the first search he fails in his endeavours—but how to arrest and alleviate the fatal effects of the malady which has so suddenly appeared, and with which he will be expected to cope. It is right of every one, be he small or great, to endeavour with all his might to find out the cause of any sudden visitation of disease; but there are many things that man, with all his learning, will never be admitted to know; and it is but fit that such should be the case, for the knowledge he may wish to make his own might not conduce to his future happiness were he allowed to do so. Philosophers

may muddle their brains until the lamp of life shall die out, and *yet* there are some secrets that they will never be allowed to penetrate. Let the whole education of the pupil in short be imparted to him, line upon line, precept upon precept, here a little and there a little, so that we may not interfere with that which we have previously taught him before it become indelibly engraven on the tables of his mind. And when our pupil shall have left our protection and guardianship, let us commit him to the care of the powers that be, and with him throw on them the responsibility of finishing his education aright.

To illustrate some part of what I have been here adducing, let me bring before your notice the history of the case which this specimen represents. It is the superior part of the trachea, with the larynx, of a yearling heifer. In the month of June I was requested by a lady in Merionethshire to examine and give my opinion upon this animal, and also a bullock of the same age and breed; they had both, I was informed, been ailing some time; at first it was thought they were suffering from cancer at the posterior portion of the tongue, but gradually their throats became enlarged, difficulty of respiration was evidenced by a sonorous noise in the use of that function, and they became thinner in spite of all the nourishing food that could be given them, although the act of swallowing was very little interfered with. The heifer was very thin, but her general appearance as to her coat, &c., was healthy; she ruminated regularly, and ate greedily at certain foods, especially at meal balls, which she appeared to manage best. I found an enlargement about the size of an egg on either side of the larynx, which you here see in the specimen; several on its upper surface, one on the posterior portion of the tongue, and I could by opening the mouth wide also detect one protruding underneath the velum palati. I at first thought of performing the operation of tracheotomy with a view of enabling the owner to feed the animal; but looking at the value of her, and the expense of feeding her, it was ultimately determined to destroy her, which I at once did; and upon flaying the throat, and removing the larynx and tongue, I found (in addition to those I have described) an immense enlargement situated immediately in front of the larynx, and also a smaller one on the inner surface of the glottis, and one on the inner surface of the inferior maxillary and attached to it. The results of the examination, I think you will agree with me, justified me in the course I had taken, and I have not the slightest doubt that, had I had time, I should have found similar productions in other portions of the body. The bullock's throat was not so much diseased, and the enlargements were situated more on the superior part of the larynx. On examining his mouth I could not detect any abnormal enlargement there, but there was a disagreeable fœtor in his breath, which led me to the conclusion that one of the enlargements had an orifice into the air passage; he was in better condition than the heifer, and as he was not so distressed in his breathing, I severely blistered his throat, ordered it to be repeated, and directed them to give as much good food as possible, with a

view to fattening him. What the result will be I of course cannot at present tell. I have since been informed that a cow of the same breed has a small enlargement of the same character as those I have described growing underneath the jaw very quickly (I should have mentioned that in cutting open the largest tumour a quantity of yellowish, semi-glutinous, semi-pus kind of evacuation took place, and underneath that a quantity of cheesy cancerous matter). On the same day, at about thirty miles distance from the location of these cases in Montgomeryshire, I saw a cow suffering from a similar affection, but as she was fat, I at once directed that she should be destroyed; also an in-pig sow, with one or two enormous tumours of the same character around her larynx; also a cow with tuberculous disease of the lungs.

Now, the subjects of this affection were all, as I have said, of the same breed, viz. the old smoky-faced Montgomeryshire breed, to which I have before alluded (in my essay on "Cancer," which I read before the members of this association), as being liable to such diseases: the question naturally was asked, What is the cause? they are bred from apparently healthy animals, every possible care has been taken of them, both winter and summer; the grass upon which they have been fed has been of the best kind, and the most nourishing food given to them whilst young and in the stalls, with a view of making them as strong and as vigorous as possible; they have not been allowed to feed upon any coarse or innutritious mountain herbage; so far as is known the water is not impregnated with any mineral or metallic solutions, neither are there any poisonous herbs in the neighbourhood; then why and wherefore should these animals be thus affected? No such disease, I may here mention, has been known before on the estate on which the first case occurred, but I have seen several on the estate on which the second took place. But the first cases occurred in animals which had been bought from the estate in Montgomeryshire, so that it is more than probable that the same cause was in operation to produce it in both.

The breed of cattle I have mentioned are always looked upon as of a very hardy nature; they are dark red in colour, with dusky or smoky coloured faces; seldom any white about them. The breed is not (as a distinct breed) extensively kept up—in fact, there is only one pure herd that I am aware of in the whole county. Now, as is always more or less the case under such circumstances, a certain amount of breeding in-and-in is inevitable, and this is the only probable solution to the question that I can arrive at, and without doubt, when such a system is carried on, the whole animal frame and organization must in the course of time become weakened, and the constitution degenerate, thus rendering it more susceptible to the influence of such maladies. In Cardiganshire there is an affection of the throat called clog disease, but as this is usually supposed to be produced by a definite cause, viz. from the cow-herds kicking the animals on the throat with their clogs, it is not so remarkable in its nature.

I have now, gentlemen, laid before you all the facts of these cases that I have in my possession, and should you, by your own experience, or by induction, be enabled to give me any clue to the cause of them, you will not only oblige me, but confer a benefit upon the sufferers by them, and enable them in the future to avoid their recurrence.

Mr. Cartwright opened the discussion by stating that the disease to which Mr. Walley referred in the latter part of his paper was common in his neighbourhood; he had attempted to remove the tumours from a heifer, but she died. As a rule, he thought they formed gradually, and sometimes suppurated. Did not consider they were glandular in their nature, but tuberculous or scrofulous, similar to the disease known as grapes in cattle in the country; he called attention to Mr. Varnell's paper on such formations in the *Veterinarian*, and said he should always recommend that an animal affected with this disease should be slaughtered.

Mr. Storrar said he had been familiar with this affection for some years. He considered it scrofulous in its nature, and so hereditary, that had he a bull with the least taint of it about him, he should sell him or do away with him at once. Cows that were excessive milkers were very subject to it, particularly if they had one or two calves to bring up every year.

Mr. Greaves asked if the disease was more common on some particular soils than others; in answer to which *Mr. Cartwright* gave it as his opinion that such was the case; but *Mr. Storrar* dissented from him, looking upon it as purely hereditary.

Mr. Wood had a case of a similar nature in a bull, and in drenching the animal the tumour gave way, and its contents escaped, curing the animal. He had also a similar case at the present time, which he was blistering severely; and he had seen twelve polled cattle at a butcher's so affected, but in each case the lungs were healthy.

Mr. Storrar adduced a case in which the course of the carotid artery was completely stopped. If the tumours were isolated and external, he recommended opening them, and dressing the interior with the biniodide of mercury, after which they would invariably do well.

Mr. Dobie and *Mr. Cartwright* mentioned cases where the membranes of the brain had shown evidence of the disease.

The conversation then turned upon the question of education; but as the time had nearly expired, it was necessarily shortened. The majority of gentlemen present considered that a practical education in the profession was absolutely necessary.

Mr. Cartwright thought that Latin and French were required as much as anything, to enable students the better to understand technical terms, and to read works written in the latter language. He considered that a lad should gain such knowledge at school before the age of sixteen.

Mr. Greaves said he wished it to be distinctly understood that he did not advocate a less degree of education than was the rule at

the present time. He wanted to call the attention of the profession, as a body, to the subject. Some of the Council advocated apprenticeship, others did not consider that a youth had better go to college first and be apprenticed after; and the profession, again, were opposed to the apprenticeship system, as they wished to teach the students without patients. Each of the latter systems he considered very bad, as when a man had obtained his diploma he would want to go into practice at once; and when called upon to treat an animal he would not even know how to go about it, thus placing him in a false position, and exposing him to the ridicule of his employers. He thought they should be made to work hard, so as to make them practical men, and make them treat patients by themselves; they should also be asked to show their indentures on seeking admission to College, and undergo a proper preliminary examination, not only theoretical and educational, but practical.

Mr. Wilson concurred with these remarks, and explained the system of education adopted in the French schools, and also said that patients were there taken in gratuitously, and the students made to treat them independently.

Mr. Wood and *Mr. Storrar* each advocated a proper education at school, the latter gentleman remarking that there were two classes of students at the present time, viz., those who had practice, and who, as a rule, hated theory, and those who knew theory and hated practice; he considered a medium class far preferable.

The President coincided with Mr. Greaves's remarks. He believed if the apprenticeship system was done away with the respectability of the profession would be swamped. They should have all necessary education before leaving school.

After a vote of thanks to the President for the able manner in which he had presided, and for his kind forethought in providing refreshments for the members, and also a vote to the Secretary for his paper, the meeting separated.

THOMAS WALLEY, *Hon. Sec.*

LANCASHIRE VETERINARY MEDICAL ASSOCIATION.

LACERATED AND CONTUSED CORONARY WOUNDS.

Being a Paper read before the Lancashire Veterinary Medical Association, at their meeting held at the Royal Institution, Manchester, Wednesday, June 16th, by GEORGE MORGAN, *Veterinary Surgeon, Liverpool.*

MR. PRESIDENT AND GENTLEMEN,—No one regrets more than I do the cause of my appearing before you this afternoon, viz., the indisposition of our friend Mr. Buckley, which prevented him preparing the paper which he was to bring forward at this meeting.

I am sadly afraid I shall only make a very poor substitute; but

you must accept the will for the deed. My efforts may not rival the many brilliant and scientific papers which have from time to time been read before you, yet I hope they will prove sufficient to provoke a discussion, useful to many and interesting to all.

The progress of veterinary science has done much towards the amelioration and prevention of many diseases which formerly devastated the property of the stockowner; and notwithstanding the reckless charges that have of late years been brought against us of ignorance and quackery, I maintain that the public have benefited largely by the advancement of veterinary knowledge in the treatment and prevention of disease, even at the pecuniary cost of the profession.

But there is one class of cases that often come under our cognisance which we cannot by any possibility prevent, viz., accidents. It behoves us, therefore, to study more closely the pathological changes that occur during the reparative process, in order that we may be the better able to assist nature in restoring the animal to usefulness in as short a period of time as possible, and to ward off the fatal consequences that would oftentimes otherwise ensue.

To a common, and what some may be inclined to designate an insignificant class of accident, I intend to direct your attention, viz., "contused or lacerated coronary wounds," generally denominated "treads;" and I think, however paltry they may appear to some, there are others who will bear me out in asserting that in rough-bred cart-horses, in our large towns, they are often the most troublesome cases we have to contend with—cases on which the practitioner must needs keep a careful eye, if he would preserve his own reputation and the life of his patient, for many of them at first sight appear so simple and slight that you often experience some difficulty in convincing the owner of the danger attending them; and if a practitioner should at first speak lightly of a case, and then come to lose his patient, he will in all probability lose his client at the same time.

That many cases of "tread" recover with little or any treatment I do not for one moment deny, and also that the subject has been so little thought of that veterinary writers have seldom bestowed more than a few lines for its elucidation; but I think the reason of this is that aggravated cases were not so common in former days as now, owing to the much lighter weights the horses had to draw.

In some parts of the country even now 20 cwt. or 25 cwt. is considered a heavy load; whereas, in the streets of such towns as Liverpool or Manchester it is no uncommon thing to find a horse shafting a waggon with as many tons behind him. No doubt some assistance is given in drawing the load; but we must remember that it is very seldom that this accident occurs in drawing a load, but more frequently in backing it, or preventing it coming too fast down an incline; in fact, during what is generally known as brechan work; and if we could calculate the difference in the amount of muscular and nervous force necessarily called into action between the shifting of one ton and twenty, we would at

the same time calculate in a great measure the amount of injury sustained by our patient, should he at this time unfortunately place one foot on the coronet of the other.

The most common seat of injury is the front, or a little to the inside of the hind foot. It may and does occasionally happen to the fore feet, but less frequently, except, perhaps, in farm horses when ploughing, when the one that walks in furrow will day after day knock one fore foot against the other, without, perhaps, any worse consequences than the ossification of the lateral cartilages.

The tissues involved are skin, cartilage, tendons, ligaments, blood-vessels, nerves, synovial membranes, periosteum, and bone.

Many will be ready to say it is a simple matter to diagnose a case of "tread;" but I venture to affirm, even at the risk of being laughed at, that many cases of tread are bad to diagnose, for there are many cases of coronary bruises without any external injury; and in such cases there is often difficulty in getting at the true history of the case, as our patient unfortunately cannot assist us, and often his driver will rather conceal it than otherwise.

The apparent extent of the injury depends in a great measure on the length of time the horse has been shod; because, if he has on new shoes, it will in all probability assume the appearance of a lacerated wound; whereas, if the shoes are considerably worn, and the square edges off them, there may be no external wound, and still a good deal of damage done to the sub-cutaneous tissue.

Now these are the sort of cases that are often difficult to diagnose. Suppose a case of a bruise where the skin is not cut—and many of you have no doubt met with such a case—not even, perhaps, a hair scarcely ruffled, the horse lame, very lame, evidently a foot lameness; you remove the shoe, pare the foot well out, and then try all the nails round, and you satisfy yourself that all is right as far as they are concerned; but if you tap the wall of the foot with the hammer he will most likely flinch. Now, then, some may say you have only to run your thumb round the coronet to find the exact spot; well, you may or you may not, but I think the more severe the bruise, unless the skin is cut, the less chance you have of finding it. I have been thus particular about the diagnosis of tread, from the fact that I have met with several cases in which it has been overlooked, and the lameness attributed to the shoeing, and the treatment applied to the uninjured part, in which case it often happens that the horse gets so lame that he can scarcely put the foot to the ground; he gives over feeding, the pulse and the expirations become accelerated, urine high coloured, the fæces parted with in small quantities, and that covered with a slimy mucus; in short, the whole of the nervous and secreting functions of the system are in a high state of traumatic fever which may possibly end in death before there is much external appearance at the seat of injury.

The reason, I think, many of these cases are overlooked is this: the blow in the first instance entirely destroys sensation in the injured part, and sufficient time has not elapsed to cause either swelling or increased sensation in the surrounding tissues, the nature of

which are such that there is little spare space for the products of inflammation.

In the generality of these cases recovery only takes place by a process of sloughing, and in three or four days the first appearances of this process presents themselves, a separation takes place between the injured and the healthy tissue, and when the slough is detached the animals begin to recover.

In other cases, especially those occurring at the lower edge of the coronary substance, just at its junction with the hoof, where there is an increased thickness of the integumental covering, as if nature had thickened the skin at this particular point for the express purpose of preventing this class of accident; and the underneath structures being principally of a tendo-cartilaginous nature, suppuration is not so easily induced as in the softer tissues, neither can it relieve itself so easily by reaching the surface; it is often, also, an unhealthy pus that is generated—more of an irritant than a laudable pus,—the consequences of which are that you have it burrowing among tissues, acting as an irritant until it reach some opposing surface, either the periosteum or the capsular ligament of the coronary joint, which it speedily destroys, and then when your slough comes away you are often left with an open joint, and, in addition, the surrounding osseous structure in what may be termed the first stage of caries; for the periosteum being destroyed, the bone is deprived of a great portion of its nutriment. Molecular disintegration commences, the Haversian canals, lacunæ and canaliculæ become enlarged, and their blood-vessels having to carry more blood to supply the deficiency of nourishment caused by the desquamation of the periosteum, become in a short time in a high state of inflammation themselves, ending in a complete mass of caries.

In other cases you will have abscesses forming right away from the seat of injury, perhaps on the opposite side of the foot.

This in my opinion is caused by the injured portion being so completely disorganised that it cannot form pus, and can only be removed by the ulcerated process, and the sanious pus that does form finds it easier to eat its way to the surface through the living tissue than the dead, the result of which is that we have innumerable sinuses running in every conceivable direction, often prolonging the period of recovery to an indefinite period.

There is yet another consequence which is connected with that formative sanious pus in this confined situation, and one which in my opinion causes the death of the patient oftener than anything else; but I must approach it with caution, as I feel that I am venturing on very debateable ground. We shall then consider for one moment the formation of pus. As you are all aware healthy laudable pus consists of two great parts, one a corpuscular or cell element, the other a watery element termed liquor puris or pus serum. Now in healthy pus the cell element predominates, that is, each cell contains within its walls several nuclei for the formation of other cells; but in those cases where the pus is thin, and of a watery sanious character, you will

find very few cells, and few or any nuclei within their walls. There is also another difference—healthy pus is always alkaline; on the other hand, unhealthy pus is always more or less acid, and even retains its corrosive qualities when out of the body, for if you place some particles of flesh in a jar of unhealthy pus they will soon disappear.

Now, seeing that we have a quantity of this unhealthy pus pent up, and endeavouring to escape or eat its way in every direction, what is more likely than that some of it should be taken up, either by the lymphatics or the blood-vessels themselves, and thus induce a pyoginic diathesis of the whole system, coagulating the circulating fluid, and producing inflammation of the blood-vessels themselves, with its inevitable results of pyæmia or pus-poisoning. This will the more readily be believed if we admit that the poisonous matter is contained in the liquo puris, which I think can scarcely be denied when we recollect that the poisonous matter of glanders is contained in the liquo sanguinis of the blood.

That this does occasionally occur I have no doubt in my own mind from *post-mortems* I have made, in which I have found large abscesses, principally in the liver and lungs of animals in which, previous to their meeting with this accident, there was not the slightest reason to suspect anything to be the matter with these organs.

I have also seen similar appearances in those organs where death has resulted from sandcrack or other injury to the laminæ.

That it does not occur more frequently may appear strange, yet I think it may be satisfactorily explained in this manner:—an animal, when it meets with an accident, is generally in a healthy state, and the quantity of pus-fluid absorbed into the blood is not sufficient to contaminate the whole mass of the blood, and the organs of secretion being in a state of activity, are able to separate it from the blood, and eliminate it from the system as effete matter, whereas in an unhealthy system, where the vital powers are already depressed, this additional is more than they can bear; the scavengers of the system strike work, and the consequences are fatal.

I have also seen in cases of this sort, where the matter has been pent up for a time and afterwards allowed to escape, that with the recovery of the animal there has been the formation of large abscesses in different parts of the body, for which I never could assign any other reason than that of pus-poisoning; and these instances have led me to the conclusion that pyæmia is more common among our patients than is generally credited.

I have dwelt thus long on the diagnosis and pathology of these cases from a belief that it is from these standing points alone that we can pursue a proper course of treatment, for I do not think it possible for any one to lay down rules to be followed in every case; and, in my opinion, the best practice is to treat symptoms with a proper knowledge of their origin and the consequences which are certain to follow if not prevented by judicious treatment.

Treatment.—In many cases this is simple enough. Clean the

wounds well with some tepid water, remove all dirt and sand, for if left they only act as irritants, and tend to augment the inflammation. Dress the wound with a pledget of tow steeped in some simple tincture, such as benzoin ; apply a bandage, give a few days' rest, and the animal is restored.

In other cases you may not see the case for some days after the accident has happened ; the animal is very lame, and the ulcerative process set in. You cannot in this case expect recovery by resolution ; and the best thing to do is to hasten on the process, for no good will be done until the slough comes away.

If you can detect pus, open it and allow its escape, and apply hot fomentations ; or you may put a blister over the part, and then envelope it in a poultice. I do not advocate the plan of putting the foot in a bag with a stone of bran for a poultice, but a neat poultice over the part. In these cases it is always advisable to give a dose of physic ; and if the horse gets feverish, and will bear it, abstract blood. We should, in all these cases, be sure to watch the pulse, as it is sure to give warning of the approach of fever, and, as I have already stated, the fever of itself will cause death.

But if you meet with a recent case, in which the animal is very lame, and the skin only slightly lacerated, or it may be only bruised, I would recommend the free application of the lancet, and by this means change this contused or lacerated wound into a simple incised one, which is more readily healed ; while by so doing you have not the same risk of a large slough, you also, at the same time, relieve the congestion of the blood-vessels, and remove the pressure on the nerves, thus reducing the risk of irritable fever.

At the same time thin the hoof below the injury with a rasp until the blood be oozing through, and if the coronary substance has been severely injured, I would cut it clean through, as there is less chance of a false quarter from so doing than if you allow the piece to slough out.

Some may say this would be better done with the firing-iron because there would be less hæmorrhage, but I can scarcely agree with this ; for while you arrest the hæmorrhage you at the same time lose a good deal of the benefit to be derived from the operation in the relief of the congestion ; besides there is little fear of excessive hæmorrhage, and if it should take place there would be little difficulty in arresting it in this situation ; put the foot in some warm water for an hour or two, as this will relax the parts, and allow the exudation to escape, then apply a pledget or two steeped in some arnica lotion, with absolute rest, which, in many bad cases, will be quite sufficient to effect a cure. But if in the course of a few days you find that you are not to have a cure by resolution I should recommend a nice poultice of linseed-meal applied over the part ; if there is much pain add some powdered opium, which often gives great relief.

In most cases after the removal of the slough there is a subsidence of the pain, but it does not always follow, owing to the inflammation having extended to the coronary joint, and when this

is the case one must be very careful to keep the animal as quiet as possible, scarcely allowing him to move, for the least exertion will sometimes cause a rupture of the already inflamed capsular ligament, and then you have in addition to your original wound a worse enemy to contend with in the form of an open joint.

If your attention is first called to the case in this stage, you generally find that the owner or some one equally ignorant has been dressing the inflamed wound with some far-famed cure-all—digestive or green salve prepared from some famous recipe of their great great grandfather,—in general causing more mischief than benefit, for in this stage I do not consider digestives advisable, but prefer something soothing, such as a simple mixture of rape-oil and lime-water, or even simple cold water applied as constantly as possible.

Some twelve or eighteen months ago, when those in high places were extolling the benefits to be derived from local anæsthesia as produced by Dr. Richardson's spray apparatus, I was in hopes that it could be applied to these and similar cases where the pain was local with the best results, but I was sadly disappointed; and allow me here to remark that I feel quite surprised that gentlemen of high standing in the profession should have lent their names to what I believe to be one of the most unmitigated pieces of quackery that has been foisted on the profession in the nineteenth century.

But to resume. Notwithstanding every precaution to avoid it, we have an open joint; it then becomes a serious question whether the animal is worth any further attempts at cure, because, taking the most favourable view of the case, you are almost certain to have a stiff anchylosed joint, and, as a necessary consequence, a certain amount of lameness, which renders the horse comparatively useless in our large towns, teeming as they do with pseudo-philanthropists who are unable to distinguish between lameness arising from the immobility of the joint and that arising from actual pain. The consequence is if they come across a case of this sort, they have him stopped, and then pulled up before the magistrates on the following morning, and fined even if assured by his Veterinary Surgeon that there was no cruelty in what he had done.

I hope, gentlemen, these few imperfect thoughts on Lacerated and Contused Coronary Wounds, their treatment and sequences will be sufficient to give rise to an interesting discussion.

PARLIAMENTARY INTELLIGENCE.

Monday, July 27th,

OUTBREAK OF SMALL-POX IN SHEEP IN SCHLESWIG-HOLSTEIN.

Colonel North asked whether it was true that there had been a severe outbreak of small-pox among sheep in Schleswig-Holstein, and if so, whether the importation of sheep from that country would be prevented.

Lord R. Montagu.—It is true that there has been an outbreak

of small-pox among sheep in Schleswig-Holstein, from which country we import about 2000 sheep per week. It is only the Queen in Council who can stop the importation of animals from any country, nor would it be of any use to stop the sheep from Schleswig-Holstein only, because in that case they would be shipped to us from Dutch and Belgian ports. Extra inspection has been ordered; but as the disease is eight days in being developed, it is quite possible that sheep suffering from it may get into this country without the disease being perceived. The only effectual remedy would be a quarantine of ten days, and even that would have to be general. The question is being considered by the Privy Council, which is anxiously watching the progress of the disease in Schleswig-Holstein.

MISCELLANEA.

THE CORNELL UNIVERSITY, U.S.

The *New York Tribune* of the 17th says:—"The Hon. Ezra Connell has just received from the Hon. and Rev. D. White, president of the Cornell University, now in London, advices of the engagement of Goldwin Smith, late professor at Oxford University, as Professor of English and General Constitutional History at Cornell University; also, of James Law, Belfast, as Professor of Veterinary Medicine and Surgery. In addition to his great literary reputation, the noble stand taken by Goldwin Smith in behalf of the Union during our late war makes his engagement a cause of congratulation by the friends of the University; while the professional reputation of Professor Law is of the highest character. These gentlemen are both to become residents of Ithaca immediately, and will devote themselves to the service of the University from its commencement. President White's purchases in London also make large and valuable additions to the library and apparatus of the University.

OBITUARY.

We have been requested to announce the decease of the following members of the Veterinary Profession:

Francis Coleman. Diploma (London) dated February 9th, 1824. Died at Dymchurch, near Folkestone, Kent, August 8th, 1868, suddenly; he was a nephew of the late Professor Coleman, and was practising at Dymchurch and Romney Marsh.

William Dearlove. Harrogate, Yorkshire. Diploma dated April 29th, 1862, Edinburgh. Died August 15th, 1868, at the early age of 29.

Charles Twist. Diploma dated May 5th, 1847. Died August 18th, at Woolton, near Liverpool, aged 44.

And also Henry Dawson, Esq., Bengal Army. Diploma dated May 24th, 1855. Died August 20th, at the residence of his father, Bush Hill, Enfield, aged 33.

THE

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Communications and Cases.

THE MICROSCOPE IN VETERINARY MEDICINE.

By Professor Brown.

(*Continued from* p. 412.)

Examination of the Blood and Contents of Vesicles of Sheep affected with Variola.

Pathologists have long been acquainted with the fact of the existence of organisms or active molecules in the lymph from vaccine and variolous vesicles. In the *Veterinarian* for August, among the facts and observations, there are two paragraphs relating to this subject, giving a condensed account of the researches by Professors Hallier and Zuern, both of whom have recently distinguished what they term microscopic cells or rounded bodies which move about here and there, and also many fine threads. These bodies, according to Dr. Hallier, are more abundant in the lymph of human small-pox than in that of cow-pox or sheep-pox.

What the precise pathognomonic significance of these organisms may be is not yet ascertained, but the subject is profoundly interesting and important, not only in reference to variola but also to other affections. Professors Hallier and De Bary have discovered a distinct species of fungus in the intestines of persons affected with cholera, and further investigations are to be prosecuted in order to finally settle the question as stated in the *Lancet*, a paragraph from which was published in the last month's *Veterinarian*, and in the current number other statements are quoted from

the *Medical Times and Gazette,* from which it appears that Dr. Hallier believes he has discovered a constant connection between six diseases and as many species of fungi.

Whatever may be the ultimate issue of the inquiry which is being conducted, there can be no doubt of the great importance of the subject to pathologists. The sources of error are, however, very numerous, and the evidence will need to be exceedingly exact before the influence of animal or vegetable organisms in the production of specific diseases can be established. Meanwhile, the object possesses great interest for the veterinary profession in this country; and having this fact in view it is proposed to publish a series of microscopic observations upon various morbid and normal fluids of the animal body, commencing with the lymph of ovine small-pox. A sufficient quantity of material for examination was obtained by inoculating a sheep with some of the virus taken from a foreign sheep which had been detained by the veterinary inspectors of the customs. The inoculated animal died in sixteen days after the operation, and the lymph was taken on the thirteenth day; specimens of blood from the same subject were examined two days prior to the occurrence of death.

As soon as possible after removal from the animal the fluids were subjected to microscopic examination, first with a magnifying power of 200 diameters, and afterwards under the twenty-fifth of an inch object-glass which magnifies about 1300 diameters. The fluid from the vesicle under the quarter inch glass appeared to consist of a few granular corpuscles with epithelial cells and small scattered fat globules. Very attentive observation led to the discovery of a few fine threads, and many minute black points which kept up a vibratory motion. Nothing of a definite character could, however, be seen of the form of these moving bodies. The twenty-fifth of an inch object-glass was next employed, and by its aid the outlines of the organisms could be distinctly seen notwithstanding their rapidity of movement. An illustration of the appearance presented is subjoined (Fig. 9.)

On the first day of the examination the round bodies were nearly all of the smallest size represented in the figure, and most or all of them possess the form of a dumb-bell crystal of oxalate of lime, except that one head is always about half the size of the other. These bodies move rapidly, tumbling over in various directions, and as the different parts are presented to view they appear alternately in the form of the dumb-bell and as rounded corpuscles, sometimes being perfectly black and at others leaving light centres, according as

they are in or out of focus during their movements. What appear as fine threads under the quarter inch objective are

FIG. 9.

Bacteria and vibriones in the lymph of ovine smallpox. Magnified 1300 diameters.

resolved into small chain-like fibres (vibriones) under the twenty-fifth. These peculiar bodies move stiffly but in a serpentine course, and frequently after passing over a certain space, pause for a second, and then suddenly turn and move in a contrary direction. The larger bodies, composed of two ovals (bacteria), were not seen until the specimen had been kept in a moist state for two days. Many minute infusorial animalcules were also seen to be present in the fluid on the second examination; these are not represented because their existence is invariable in all fluids which contain organic matter, either animal or vegetable. For the purpose of ascertaining whether any of the organisms will undergo further development, the specimen from which the illustration was drawn is being kept moist by means of a small strip of cotton cloth, which passes from the edge of the covering glass into a vessel containing water; the cloth being kept wet by capillary attraction prevents the specimens from being dried up.

An examination of the blood of the diseased sheep gave similar results; the moving bodies were very numerous, but exceedingly minute; the blood corpuscles were healthy in appearance. There being nothing peculiar in the specimen, it was not thought necessary to attempt the cultivation of the germs in the blood, as the contents of the vesicles could be so much more easily kept without the risk of interference with the experiment from rapid decomposition of the fluid, a result which in the case of blood is certain to occur.

(*To be continued.*)

THE QUESTION OF THE DAY: WHAT KIND OF EDUCATION WILL PRODUCE THE MOST EFFICIENT VETERINARY SURGEONS?

By Thomas Greaves, M.R.C.V.S., Manchester.

(*Continued from* p. 603.)

In my last paper I considered the advantages which were derived from a practical training; I will now proceed to the consideration of the third question, viz.:

"Is the time expended in acquiring the higher branches of a scientific education occupied at the expense of and to the exclusion of practical knowledge?"

In the first place allow me to explain myself, so that I cannot be misunderstood. I consider the education imparted at the Veterinary College as being indispensably necessary; and if I had the power in my hands I would allow no man to practice the veterinary art unless he had attended two or more sessions at one or other of the recognised veterinary colleges, had progressed in knowledge to the satisfaction of the professors of such college, and passed a satisfactory examination before a properly constituted board of examiners, and by these means rendered himself worthy of the honoured name of veterinary surgeon.

I do not propose to breathe a whisper in the way of dictation, nor in the slightest degree to trench upon the subject of the teaching at the colleges, or the duties of the professors; my object is to discuss the question as to what is the best kind of education in youth, with the view of producing the most useful and efficient men.

I know it is contended that a classical education unlocks the richest intellectual stores, that a knowledge of ancient Greek and Roman literature, with their richness of language and scientific precision, constitutes a part of the education of a gentleman; that it not only improves the memory, expands the intellect, and sharpens the judgment, but also communicates to the mind that nameless grace, that tact and mental delicacy, that high-toned dignity, vigour, and nobility, which, when acquired, at once place their possessor in an exalted station. Now, although I am quite willing to grant that in past times civilization was undoubtedly deeply and lastingly indebted to the ennobling and elevating effects of the ancient Greek language upon human knowledge and human character as a most powerful agency or appropriator of human

thought, and that, even in the present day, a knowledge of modern Greek and Latin gives an extra polish to education; still, in the present state of civilisation, circumstances have clearly altered the relative value and importance of the knowledge of the dead languages.

There is now no knowledge relating to the physical and moral worlds which does not exist clearly expressed in English, and there is no mode of feeling or of thought subservient to the practical purposes of life that may not be forcibly and elegantly clothed in our native language. Human institutions and practices however, long survive the causes that gave them birth, and from five to seven years of our lives in youth are still dedicated to the study of the learned languages as if all their original importance remained. Education then, consisting chiefly of languages, leaves the mind of the pupil ignorant of things, ignorant of men, and ignorant of the constitution of the social system in which he moves; he is trained in abstractions and amongst shadows, and when he enters practical life he finds that his real education is only then at its commencement.

It is better to have ten ideas and have only ten words in one language to express them, than to have only one idea and have ten words in as many different languages for communicating it; for example, a highly educated man could tell you that the name of a certain animal is, in Greek, hippos; in Latin, equos; in English, a horse; in French, cheval; in Italian, cavallo; in German, pferd. Such a one may be a gentleman; he is learned, but his real knowledge of a horse is not in the slightest degree increased by the acquirement of these six words, to express the name of the animal. A youth trained in the stable-yard, knowing only his mother tongue, would in all probability be far superior to him in a knowledge of the nature, as a judge of and far more competent to take charge of such an animal,

> "Not to know of things remote, obscure and subtle,
> But to know that which before us lies in daily life,
> Is the prime wisdom."

Practical efficiency is what is wanted for the business of this world, not absolute perfection. The grand end and aim of education is obviously to bring up the rising generation to a level in point of intelligence with those whom they have to join in the pursuit of life. To accomplish this involves a very considerable amount of general knowledge, including more particularly, not a minute acquaintance with ancient history and mythology, and a critical proficiency in various dead languages, but a thorough understanding of the

relation of man to the material world, natural and social laws, and such like. I would say, let the youth intended for the veterinary profession be taught to write a good, legible, business hand; be taught English grammar thoroughly, English composition, English history, arithmetic, mathematics, natural history, geography, French, and Latin. This education he ought to have acquired by the time he is fifteen, sixteen, or seventeen years old; he should then be apprenticed to a veterinary surgeon for three, four, or five years, to enable him to acquire business habits. Let his vocation become natural to him. He must be constantly occupied, working daily amongst sick and lame horses, compounding medicines, and employing his leisure time in reading works upon his profession. This knowledge becomes embodied in him, and is apparent through life. I cannot repeat too often the value and importance of serving an apprenticeship; it produces an aptitude, an expertness, a familiarity with the work in all its details, and an intimate knowledge of the nature of the duties, which, if not acquired in youth, the golden opportunity is lost never to return.

The query may be put by some of my readers, But how and where is the youth to be placed apprentice? who would be bothered with one to teach him his business?" I am sure I need not occupy much time in answering these questions. Amongst the hundreds of veterinary surgeons that I am acquainted with I scarcely know one who raises an objection. I know scores who regularly take pupils. One of my friends, a V.S., informed me that he had netted £500 in one year by it; and there is scarcely a month passes but I have an application from some V.S. or other, saying they have a vacancy for a respectable and well-educated youth. It is true it entails anxiety and responsibility; still we must not forget that the fee of £100 is not to be thought lightly of; and after one year or a year and a half the youth is becoming every day more and more useful to us, to say nothing of the pleasure of seeing his mind expand, and the inward consciousness of doing our duty. The young man of considerable culture and intelligence having passed the stated period at college and got his diploma, never having worked amongst sick and lame horses, feels a timidity, an awkwardness, and every casual observer notices his awkwardness. This inaptitude continues with him more or less throughout life, to his no little detriment and loss.

I remember several examples of this kind occurring under my immediate notice. On one occasion, a gentleman applying to me for a situation as an assistant, being in the country

some miles from a smith, and it being necessary to take off the shoe (a hind foot), to examine the foot he was requested to take it off. I handed him my shoeing tools for that purpose, when lo and behold! he tried to place the hind foot between his own legs, in order to unclinch the nails, when the horse giving a sudden jerk, he was left prostrate upon the ground, to the no little amusement of the attendants. Again, on another occasion an applicant for a situation, being requested to give a horse a draught, directed the attendant to hold up the head with staff and cord; and whilst in this position he seized hold of the horse's tongue with his left hand, drawing it out, and with his right hand was about to horn the draught down the throat, when I interfered. Again, on another occasion, an applicant for a situation, who was requested to give a horse a draught, gave it with his topcoat on and black kid gloves on; he has gloves on also when he gives a ball. I need not add that in each of these cases the veterinary surgeons (so they were) had seen little or no practice, and had not served an apprenticeship.

But in addition to awkwardness and inaptness, which are offensive to witness, there is another drawback which often arises. The man who has had the good fortune to possess a high classical education cannot disabuse his mind of the fact that there is a great disparity between him and the groom—there is a gulf between them which often prevents them from working together; their habits of thought, their views, their sympathies, are all dissimilar. The veterinary surgeon often takes umbrage, and feels himself aggrieved because sufficient deference is not paid him and his opinions; cross purposes are secretly at work, some hitch or other exists, the case does not succeed, the V. S. lays the fault upon the attendant, the attendant lays the blame upon the V. S.; nothing goes on smoothly or satisfactorily.

I can easily conceive a V. S. such as the above, but who also possesses good sense, who, comprehending his difficulty, seeing and feeling the absolute necessity of mastering details, although he has an innate repugnance to them, yet being resolved to succeed, he resolutely applies himself with a sort of forced mechanical persistency and earnestness, and ultimately he may succeed tolerably well; but it is an exceptional case.

The next point of importance is the character of the preliminary or initiatory examination. The word initiatory is preferred by some to preliminary in regard to the examination of the young man as he presents himself to become a student at the Veterinary College. The word preliminary may with pro-

priety be used to any and every examination of the student, even to his final examination for his diploma it is preliminary to him being received into the profession; not so the word initiatory. Whatever the specific nature of this examination may be, it should be clearly defined, agreed to, and faithfully carried out by each college; but whatever other questions are decided to be put, the question of questions should not be omitted, viz., "Have you seen practice?" "Have you served an apprenticeship?" Do not startle at these ominous questions. I know the danger, the delicacy that attached to it in a past dark age. In my next paper I will endeavour to discuss this question with all care and moderation, as well as the desirability of now applying for and obtaining a Bill from Parliament, which will prove a lasting benefit to Scotland equally as to England. That such a Bill may be obtained there is but one opinion; and the governors of the colleges, or the Council that will not make an effort to secure it, will forfeit the splendid opportunity of the time, and will fail to gain the confidence of the great body of the profession.

THE PRINCIPLES OF BOTANY.

By Professor Buckman, F.L.S., F.G.S., &c. &c.

(*Continued from p.* 606.)

In considering the leaves of plants, we may regard them as a continuation of the bark in which the ligneous system expands into a framework of *petiole*—footstalk—midrib and nervules, and the flattened *pagina* is composed of simple cellular tissues. In the higher forms of plants, a continuation of the pith includes spiral vessels, and in these the whole structure is liable to rupture at the base of the petiole, leaving an eschar, and causing the phenomena ending in the fall of the leaf, an account of which might well form a chapter by itself, but we must leave this subject and give a more particular description of leaf structure with a view to an account of the functions of these organs.

Structure of Leaves.—These are called lateral organs in distinction from the descending organs or root appendages, and stem or the ascending plant-axis; with some exceptions they have a flattened expansive pagina or leaf-blades, consisting of an upper and under surface. In many leaves the

upper surface is of a darker hue than the under one, because while the first has the epidermal cells or cuticular layer more closely attached to the *parenchyma*—leaf matter—the latter has a peculiar cellular arrangement forming *stomata*, or breathing pores, beneath which are intercellular spaces, and hence that want of more intimate union which prevents the green of the leaf from being much seen through the cuticle. Stomata occur on both sides of the leaf, but in varying proportions. In leaves having an upright direction as the common pink, their number will be equal on both sides, and so the colour will be alike on both surfaces.

In the water lily, which at first grows upright from the water, active stomata occur on both sides of the leaf, but as this organ lays flat on the surface the stomata of the underside all become sealed up and are rendered inactive, and their functions are wholly performed by those of the surface.

The numbers and diverse arrangements of the breathing pores of some plants may be seen by referring to the following table taken from Professor Balfour's 'Manual of Botany :—

Stomata in one Inch Square.

	Upper Side.	Under Side.		Upper Side.	Under Side.
Mistletoe . .	200	200	Mezereon . .	None.	4,000
Tradescantia .	2,000	2,000	Pæony . .	„	13,000
Rhubarb . .	1,000	40,000	Vine . . .	„	13,600
Aloe . .	25,000	20,000	Holly . . .	„	63,600
Clove-pink . .	38,500	38,500	Cherry Laurel .	„	90,000
Yucca . .	40,000	40,000	Lilac . . .	„	160,000

Besides these peculiar cellular arrangements, leaves often have cells growing outwardly, forming hairs, glands, &c.

Leaves, like the bark of many plants, present both in their tissues and their contents several active chemical principles, on which account the bark and foliage of a large list of plants are used as remedial agents. Among these the bark of cinchona, cassia, cinnamon, &c., leaves of henbane, hemlock, nightshade, and others will recur to the mind of the student, while in most so-called roots the active principles mostly reside in the bark: such are gentian, taraxacum, sarsaparilla, &c. The peel of the tuber of the potatoe, like its leaves, contains the poisonous principle, *solanine*, and hence the water in which potatoes are boiled should never be given to animals, but these tubers in being boiled for pigs should always be strained, as we have experienced the evils of neglecting this precaution.

Functions of Leaves.—Plant-life is maintained and vegetable products are formed in virtue of several functions which may be tabulated as follows :—

1. *Absorption* or *Imbibition,* in which food enters the structure of the plant in the root spongioles.

2. *Exhalation,* a leaf-function by which superfluous water is given off through the leaves.

3. *Respiration* and *assimilation* of fluids, corresponding to digestion in animals.

4. *Secretion,* the formation of peculiar matters, as essential oils, alkaloids, &c.

1. Absorption.—The consideration of this function introduces us to the subject of the *circulation of the sap.* In describing this we would guard against the supposition that plants contain any circulatory system, any arrangement of vessels, analogous to the circulatory system of animals ; on the contrary, fluids ascend in plants for the most part in virtue of the physical agency described as *exosmose* and *endosmose,* by which means an interchange of cell contents takes place, namely, a transmission of the more fluid contents of the lower cells to those above, while the thicker fluid of the upper cell is transmitted to the cell below, thus producing the movement known as the circulation of the sap, a process usually dormant in winter, as the fluids at that season either become concentrated by the decrease of temperature or are brought to a state of equilibrium.

2. Exhalation.—As soon as the leaves begin to expand in spring, they begin to exhale watery fluid. This exhalation, the evaporation of water, as pointed out by Henfrey, is, of course, subject to great modification, from its close relation to, and dependence on, external conditions, such as the dryness or humidity of the surrounding atmosphere. The most important, however, is exerted by light. It has been ascertained that the amount of exhalation taking place in the shade, at a given temperature is very much less than that occurring at an equal or even much lower temperature in the sunlight. The vapour is not always that of pure water, but may contain various proportions of the gases present in, or liberated from, the tissues of the plant. The peculiar appearance of a fluid circulatory atmosphere observable over a cropped field in sunshine or a still day is the result of exhalation. A bell jar placed over growing plants in sunshine is soon bedewed with moisture, the quantity of which varies greatly in different plants: thus Hales ascertained that a cabbage with a surface of 2,736 square inches transpired at an average of nineteen ounces. A vine of 1,820 square inches,

from five to six ounces. Professor Balfour describes the following ingenious method for observing the process of exhalation: "Take a fresh leaf with a long petiole, put it through a hole in a card which it exactly fits, and apply the card firmly and closely to a glass tumbler, about two thirds full of water, so that the petiole is inserted into the water, then insert an empty tumbler over the leaf, and expose the whole to the sun; the fluid exhaled will be seen on the inside of the upper tumbler. The experiment may be varied by putting the apparatus in darkness, when no exhalation takes place, or in diffuse daylight, when it is less than in the sun's rays."

As regards the exhalation of gases, we would point to the collection of oxygen from water plants, which we have obtained from the newly introduced Canadian water-weed by means of a gas jar, filled with water, and held over the thick masses of the plant during bright sunshine. By this means we have procured sufficient for exhibiting the chemical properties of the gas.

3. Respiration is pointed out by Henfrey as being accompanied by a large amount of exhalation in plants as in animals, but inasmuch as he regards respiration as a process of digestion, we may well be excused for keeping them distinct. The leaves are mostly concerned in respiration, but in the cacti, and some other plants where the leaves have been diverted to some other office as the production of spines in the first-named plant, they possess strangely contorted angular or corrugated stems, thus, as it were expanding the bark for the performance of the leaf-function, so in the yellow vetchling —*Lathyrus alphaca*—the leaves being diverted into tendrils for climbing purposes, the *stipula* becomes enlarged for carrying on the leaf action.

The grand agent in aiding respiration is light; by its agency the carbonic acid imbibed by the roots, or inhaled by the leaves or by both processes is decomposed, the carbon being retained to build up the plant structure, while the oxygen is exhaled: hence, then, the balance maintained in the atmosphere by means of the two kingdoms—the animal and vegetable. The former exhales carbonic acid during the process of respiration, while the latter inhales it, and in its assimilation gives back that oxygen to the atmosphere which is abstracted from it by both the animal and mineral kingdoms.

It is again in this assimilation that organic products are developed, and upon these our animals feed, and it therefore follows that a knowledge of the laws connected with the life of plants is of great importance in connection with the development and well being of animals.

4. Secretion.—This seems to be rather an effect connected with the respiratory and assimilative processes already described than a distinctive function of plants. Plants do not excrete effete matter by their roots as was once supposed, but it would seem that in the process of assimilation, such matters as sugar, oils, resins, acids and saline substances with peculiar principles known as alkaloids, besides wax and mucilaginous substances and the like are either stored up as secretions in different parts of plants, or are the results of decomposition, such, indeed, as mucus in animals, which is formed from the decomposition of epithelium cells.

That plants require the presence in the soil of different mineral substances is well known, such as phosphates for the cereals, salt for many littoral plants, and manurial matters for all kinds, but this is so, not that they secrete these matters, but that they really enter into the composition of their tissues, and hence it is, that we cannot continuously cultivate the same plant in the same spot, for if it be exhausted of these, it will be necessary to restore them, in the shape of manure, or the plant will either dwindle, or cease to grow altogether. Having then glanced at the functions of leaves, we may not inaptly conclude this part of our subject with a quotation from Henfrey—

"The term nutrition does not appear to be applicable to any process in vegetable life. Unlike animal organisms, where absorption is continually removing effete structures, to be replaced by the nutritive powers, the organs of plants are produced by development, which continues up to a certain point; the organ after this merely acts in consequence of mechanical structure, and when effete, dies and decays. In plants all is *growth*, as distinguished from the reproduction of removed or decayed parts, which is the office of the nutrition of animals."

A CASE OF BRONCHITIS, OR GANGRENOUS INFLAMMATION OF THE LUNGS, COMPLICATED WITH HEPATITIS.

By J. B. Hall, M.R.C.V.S., Agra.

On May 9th, C. F. Hall, Esq., of this station, sent a messenger with a grey pony to ask if I would be good enough

to prescribe for it, as it was out of health. On examination, considering it a case of some interest, I wrote back to say that if he wished I would take the pony into my stable, that I might have a better opportunity of watching the progress of the disease, and asking at the same time for any particulars connected with the case with which he was able to furnish me. I received an answer to the effect that he considered its mouth had been injured by the Syce in giving it a ball, that it had been ill for four days, took its food very sparingly, and occasionally coughed. The ball he subsequently told me contained pepper and salt, as he thought at first that the pony had worms. On examination the following symptoms were present:—A short dry and painful cough, hurried respiration, Schneiderian membrane injected, but of a somewhat livid colour; sharp contractions and relaxations of the abdominal muscles, with a slight mucous discharge from both nostrils. No variation of the temperature of the extremities, as is almost always present in bronchitis, of one leg hot and the other cold. The tongue and membrane of the mouth furred. Pulse low, weak, irritable and quick, with much anxiety of the animal's countenance. Although the case presented most of the symptoms of bronchitis, still, on examining the chest, there were no clear indications of that disease, but a mucous *râle*, with a nearly inaudible respiratory murmur. I could also hear a gurgling mucous *râle* when at a little distance from the animal.

Taking all the symptoms into consideration which I have attempted to describe, I considered the case not to be one which called for the use of tartar emetic, calomel, or bloodletting. I however applied a sharp blister of Hydrarg. Biniodidi to the chest and throat, and administered a draught composed of Liq. Amm. Acet., Spts. Æth. Nit. and Hyoscyamus.

May 10th.—On going to the stable this morning, I found my patient to all outward appearance the same: he ate some bran the previous afternoon, also this morning, but there was slight fetor from the nostrils (just perceptible), the dung balls hard and slimy; blister on the chest has acted well, but it has not taken much effect on the throat; reapply blister to the throat, give Decoction of Aloes ʒiv, Spts. Æth. Nit. ʒj, Tinct. Hyoscya. ʒss, also wash mouth and nostrils with Condy's fluid diluted. At 1 p.m., being a little uneasy, gave Opium ʒss.

11th.—This morning the fetor was more perceptible: there is no doubt about it now; gangrene of the lung has set in consequent on bronchitis, or has now become apparent

from the low typhoid inflammatory action, all the symptoms being from the first asthenic, or at least from my first seeing the case: he occasionally lies down for a few minutes, sometimes remains as long as ten or fifteen recumbent; pulse no better, but irritable and confused; more mucus or mucopurulent discharge from the nostrils, and getting very offensive; mouth and nostrils washed with Condy's fluid; he ate a small portion of soaked grain; bowels regular.

12th.—Patient weaker; a great deal more discharge from the nostrils, getting darker in colour and very offensive. There being still derangement of the digestive organs, I repeated the aloes, giving ʒij in solution in combination with Nitric Æther and Hyoscyamus. Case a hopeless one; but the owner was extremely anxious treatment should be persevered in: the horse ate a very small portion of soaked grain; so administered linseed tea. I notice, when lying down, he places his nose exactly over the region of the liver on the right side. Examined the mucous membrane, but found no biliary discoloration; a watery fluid, tinged with blood, drops from the eyes, and the heavy appearance convinces me there is intense headache.

13th.—Gradually becoming weaker; fæces of a clayey hue, but pultaceous; discharge from nostrils very offensive: injected a weak solution of Condy's fluid, it being quite disagreeable to remain in the stable; this does not cause the least irritation, and in a great measure does away with the offensive smell.

14th.—Died at 9 o'clock, a.m.

Autopsy on removing the liver.—The investing membrane was slightly inflamed; there was also inflammation all round the periphery, extending from four to five inches; this was the same in all the lobes. Upon making a section of the viscus, the inflammatory portion presented a dark brown colour, but no disintegration, induration, softening or enlargement noticeable, merely black blood issued from the cut ends of the vessels. On reaching the larger vessels, and thick part of the substance of the liver, the section was more healthy; in fact of the natural liver appearance usual in health. The lungs, on removal, presented a yellowish-green, intermixed with a darker green or blackish hue; on other parts a deep violet hue on the surface. On cutting into the substance of the lung there were no abscesses proper; the substance exuded a darkish sanies, and slightly offensive. On reaching the larger cells and termination of the bronchia, I found they contained little fibrinous balls, from the size of a pea to five times that size. The lungs did not exude the greenish-

grey, and excessively putrid sanies generally found in gangrene, or I should have supposed, from the *post-mortem*, this had been gangrenous inflammation from the first, instead of complicated bronchitis, if I may use that term. The sun now became excessively hot; and you may fancy what it is at 10 o'clock, in the hottest month in about the hottest station in India. So finding it most inconvenient to go on with the examination, I had the carcase removed after taking these few notes.

Remarks.—In this case I have come to the conclusion that the disease of the liver was some days subsequent to that of the lungs, the liver having every appearance of being recently attacked; that is, on May 10th, or the second day. It must be considered he was ill four days previous to coming under my observation, so that inflammation of the liver may be considered symptomatic or vicarious, bronchitis being often associated with disease of the liver, and most likely men or animals most subject to these attacks have chronic disease of the liver. Horses certainly, in this country, are very subject to a kind of chronic hepatitis, accompanied with constipation of the bowels, fæces covered with mucus, and a low type of fever; and much larger doses of calomel can be given than in England or more temperate climates, and no doubt small doses of it frequently repeated might have been given with advantage in this case if seen sooner, but when first seen by me the pulse was unfavorable for that kind of treatment. I shall be pleased to see any criticism or remarks the editors of the *Veterinarian* may seem fit to make, if they deem this worthy of a place in their journal.

There being no work on hippopathology at present written suitable to the equine diseases of India, I have it in contemplation to bring out a work of the kind in the course of twelve or eighteenth months. The knowledge I have at present, and matter necessary for such a work, is chiefly from my notes and experience during the mutiny, with the assistance I feel sure of finding from those of long Indian experience. So, if I am able to carry this out, I purpose forwarding the different parts as written to the most experienced veterinary surgeons in India for emendation, and feel sure their assistance will be cheerfully given, a work of the kind being undoubtedly much wanted. The symptoms, the course, the complication of disease, is so different in India to a temperate climate, and certain diseases are totally unknown in Europe. Any one on first coming to this country is confused, and can only get knowledge by his own experience at present.

SUCCESSFUL TREATMENT OF ACUTE RHEUMATISM, WITH LARGE DOSES OF ALKALINE MEDICINE.

By Alfred Withers, M.R.C.V.S., London.

I thought the particulars of the above case might be interesting to some of your readers, and have therefore sent them.

The subject is a four-year-old bay carriage horse. His illness dates from June 1st, when he was in plethoric condition and doing no work. At that time he was found to have a cough, which, notwithstanding change of air and treatment, increased; bronchitis followed in a very severe form. By June 20th he had got over the worst of this, and was rapidly improving, although he was very weak and debilitated, when symptoms of strangles appeared, which lasted about ten days, and still further decreased his strength. On July 1st rheumatism came on; the horse became suddenly lame in the near fore leg, the fetlock-joint being very much enlarged and tender. By the 6th the other leg was affected in the same way. From this time he became gradually worse to the 14th, a fortnight after the first appearance of the disease; he was then in a deplorable condition. If he stood it was with his hind legs carried far under his body, and his fore legs advanced; mostly he laid on the ground moaning piteously.

For a fortnight after the appearance of rheumatism, no treatment had been followed, except the application of belladonna poultices to the joints, which seemed to give some relief. It was then I conceived the idea of putting him under the full alkaline treatment. Accordingly for a fortnight he received daily Pot. Carb., Sod. Carb., Pot. Nit. with Pot. Iod. Of the first and second we commenced with ʒj of each, increasing it to ʒiij; of the third ʒss, increasing it to ʒij; of the Pot. Iod. we gave ʒiij from first to last. After a week of this treatment our patient walked round the box, and seemed perfectly free from pain. At the end of a fortnight he ran quite round, and the swellings had quite disappeared from one fetlock, and nearly so from the other.

Although this treatment had achieved much, so much as far as the rheumatism was concerned, I must add that it did not tend to improve his general health. An abscess appeared

under the jaw, where the abscess of strangles had formed and suppurated. However, with generous keep, and half a pint of cod-liver oil a day, with a tonic in the form of the Liq. Arsenicalis, he is rapidly improving in health and condition. We commenced giving him cod-liver oil in flour gruel when his desire to eat had almost entirely left him, partly perhaps on account of the pain and difficulty of swallowing in consequence of the abscess already alluded to.

I claim nothing whatever original in the treatment of this case. I have simply tested in the horse the value of a treatment which has been highly successful,—in fact, almost the only treatment which has been successful at all—in combating this formidable disease in the human subject. It was in a pamphlet on the subject by Dr. Dickinson, of St. George's Hospital, that I first became acquainted with the results of this treatment in man—results so conclusive and satisfactory in their nature, that it was but reasonable to hope that the same effects would follow its adoption in the lower animals. As far as the present experiment goes these hopes have been satisfactorily fulfilled; but it would be wrong to conclude too much from this isolated case; and I would venture to suggest that other veterinarians would give the treatment a fair trial.

Large as the above mentioned doses appear to be, they are not out of proportion to the quantities administered to man under like circumstances; the full alkaline treatment for him being ʒss to ʒiss of alkaline medicine during the day.

The medicine in this case was given in the form of balls, as many as six being given in the twenty-four hours.

HYDROCYANIC ACID IN TETANUS.

By A. Challinor, M.R.C.V.S., Bolton.

On perusing your issue for this month, I saw the notice of the Liverpool meeting, at which there was a discussion on tetanus, with which I was much interested, having had a case under my treatment lately, particulars of which are as follows: At the latter end of July last, a small bay mare pony (aged), the property of Samuel Scowcross, Esq., Rose Hill Colliery, Bolton, was being driven a journey by the owner's groom, when through some cause it fell and fractured the nasal bones. On the 5th August, it was brought to our

place, and presented all the symptoms of tetanus in the first stage; the jaws were partially closed. I at once administered aloes ʒiv, and took three quarts of blood from her, stimulated the whole of the spinal column, and covered her with a sheepskin, placed her in a dark stable, locking the door and retaining the key in my possession, giving strict injunctions to the workmen in the yard to make as little noise as possible. On the following day I found that her bowels had acted, and then I administered hydrocyanic acid in half drachm doses twice a day, and also applied a blister to the face (my method of administering the acid was by a small tube, which I found to be the best plan). On the 7th she was a little better. I continued the acid for fourteen days; she gradually improved and is now entirely well.

I attribute the cause of tetanus to the excessive heat of the weather.

EDUCATION OF THE VETERINARY SURGEON.

By "Forfarshire."

In the *Veterinarian* for August, I observed Mr. G. Whincop's remarks, in which he states "that the majority of veterinary surgeons are of a phlegmatic class;" and further on he says, "Now is the time to speak." As a new member of the profession, I ask, why did you admit me to be one of your number before I could write in a grammatical style to your valuable journal? I don't consider that I myself am to blame in this respect; for had the college doors been closed in my face when I offered myself as a pupil, it would have been the greatest blessing I could have received. I had as much love for the profession then, as would have made me spur up in all the branches requisite for a preliminary examination. Then who would have been benefited by it?—myself, the profession, and the public. But as I had no great opportunities of acquiring what might be called a good classical education, I felt content to move in the same sluggish state. I entered college without meeting with any impediment notwithstanding my lack of education. Whether you can read or write plain English, I believe is a question seldom or never asked. The fees are paid, the classroom is entered, the lecture commenced. Then poor Mr. Student thinks the words have rather a peculiar sound, and their meaning and pronunciation are altogether out of the

question. A few more lectures over, *and then, if never till then,* he feels the want of a good English education. There are but few young men that are not greatly disappointed when they enter college for the first time, and are apt to overlook the position in which they are placed until it is too late; then they find themselves standing in the back ground, and have scarcely entered upon their studies, when they begin to talk about passing their examination. The majority abhor the idea of studying more than two sessions; they think all is right if they obtain the diploma of the Royal College. I know a few who have been admitted members in two sessions; by no means do I despise them, for they are hard workers and are likely to labour towards the advancement of science, after they have received the diploma of the college. But there are numbers who will not work hard when at college, and, perhaps, are not so good in four sessions as those that have passed in two. The man that has a good education can better himself at any time, if he has the mind to try; whereas the man with an inferior education is not likely to do so, for he knows his deficiency, and is afraid to commit himself, therefore he finds it more easy to remain in his phlegmatic state rather than to battle with such a weapon as a *pen* in his hand. Happily there are a few that enter the profession with a good education; if it were not for these few I fear there would be no such thing as a valuable *Veterinarian.* I think the questions put forth by Mr. Greaves upon education might stir up every member to state his opinion on the subject; it would be well if it were so, let them be ever so erroneous. I for one am anxious to state my opinions, but for one good reason feel unable to do so. Whether it is for want of a "highly scientific education" or not I am unable to say, but I know it is for want of a better education; and while I know I am thus bad I also know that many of my fellow students were no better. In my opinion, Mr. Greaves does not know the *want* of a good education as many of us do that have entered the profession lately, and are likely to retard its onward progress. But I believe there is a great amount of truthfulness in the answer Mr. Greaves has given to his first question, bearing upon practical purposes; for the latter a high education is not greatly required; but that is not all that is needed of the veterinary practitioner; if it were so, blot out the word profession, and if you are acquainted with an *empiric,* ask him what he gives a horse when attacked with *colic,* and note the prescription down in your day book, and when you meet a case that you do not understand why you must take so much blood from the horse

and give him a dose of physic, and in this go on day after day, and put the poor animals you deal with through the same *routine* of treatment. What use is there in going to college and studying at all, if it is only to end in recipes and formulæ that your forefathers used? I fear this is too much the case. I feel this inclination taking hold of me already. I am not a "highly educated individual," but have often been the victim of scientific perplexities, and had it not been for empirical practice before I entered college, there would have been more of them to contend with; therefore, as far as these perplexities are concerned, I think a classical education will not increase them in the least. I have often thought they would have been diminished by more learning, but perhaps not. I have always thought that a well educated man weighed matters with more calmness of spirit than the ignorant. But, perhaps, there are two classes of veterinary surgeons, at least one is apt to imagine that two classes are necessary, one as "associates for the gentleman," and another for the groom. The groom, perhaps, has the power to call any one to treat his horses he chooses, and most likely he calls the one who will take a glass of beer along with him. I fear a man with a "highly scientific education" would not succeed well in practice in some country districts, in Scotland, at least, for when he was called in he would often find he would not be recognised, nor treated as an educated man ought to be, through the ignorance of his clients. A fastidious individual in this case will scarcely be able to earn a livelihood, for the skill of the horse- and cow-leech will be exhausted before he is called in, and most likely he will have more deaths than recoveries; then his clients are apt to conclude that his services are no better than those of the quacks; and his accounts must be higher for the latter seldom make charges at all, and the primary expenses are so much considered by some farmers; and the secondary effects are altogether overlooked, and many of them will not be convinced of their folly. If the veterinary surgeon is not able to withstand all these annoyances for a few years, he is compelled to abandon his position. All this is the more acutely felt by a man from the higher sphere of life, than by one from a lower scale. This makes me remark that a preliminary examination will not require to be of too severe a nature, or it would keep many a good man out of the profession, but a certain amount is highly necessary. I am happy to think all is working towards the mark by slow degrees. Perhaps it may be startling to some, but not the less true, that in different parts of the country they know nothing about

such men as veterinary surgeons. There is much room for cultivation by men who have a love toward the advancement of the profession, and who will leave *money* as a secondary consideration. In concluding my first attempt, I must say that I regret to find so few veterinary medical associations in Scotland, and think it strange, as the editors have remarked, "Why some keep themselves so much aloof, and never by act or deed give proof of their membership;" and I am still more astonished to learn that a member may neglect to even acknowledge a letter on any peculiar case to which two members may have been called; all this has a tendency to retard the art and science of our chosen calling.

VETERINARY EDUCATION.

By "A Country Practitioner."

A good deal of space has lately been occupied in the *Veterinarian* by discussions on veterinary education, but my present communication refers more particularly to Mr. Greaves's paper in the current number. Mr. Greaves's remarks seem to me to refer especially to *country practitioners*, who certainly have by a great majority the preponderance as to numbers. Mr. Greaves, however, great as his experience may be, can scarcely be expected to know much about the wants and requirements of *country* practitioners, a body of men who are to a great extent isolated from their urban brethren. I hope I may, therefore, be permitted as a very humble unit of that body, to controvert some of Mr. Greaves's statements.

First, as to education. Does a country veterinarian require an education superior to that which will barely suffice him to obtain his diploma. In other words, will a classical education and such other educational advantages as most youths in the middle class of society possess now a days, be of any advantage to him, or will such be a positive drawback, by giving him ideas (I use the old phrase) "above his station." I emphatically answer such an education is a positive advantage. How can a man discuss the current scientific topics of the day, name botanically a common poisonous field plant, give the correct term to a parasite, or answer the hundred and one questions any educated man with a smattering of science may put to him, unless he has something more than

a fair English education. I do not mean to say that this extra education is a *necessity*, nor am I sure it is a pecuniary advantage, but *I am* sure it adds to a man's social standing. Then, as to education inducing a false refinement (an argument often used by adversaries to progression) I can only say that in my own experience I have known some of the most painstaking and working practitioners highly educated men, and, on the contrary, and may I not say as a rule, the roughest specimens are not model practitioners ?

Now, as to the social portion, and professional comforts and discomforts of a country veterinarian's life, the latter of which are so vividly set forth by Mr. Greaves. To be called up in the night is not such a very common occurrence as Mr. Greaves would lead us to suppose, nor do we always ride or drive ten or twenty miles (I should not care about riding or driving twenty miles out *habitually* by day), five or six miles is a very much more usual distance. Well, our night's ride having been accomplished, what do we as a rule meet with, hinds, or serving men, with the cold welcome of a cow-shed, or loose box to pass several hours in? No, generally, I think, we are greeted by a very anxious employer, who, after he has ascertained our opinion as to the disease his beast or horse is labouring under, what treatment is recommended, &c., &c., gives us a good old English welcome, and presses upon us the hospitality of his house according to his means. I have generally found a warm fireside, and comfortable sofa, when obliged to watch a case, instead of a cow-shed or stable.

On his ordinary daily round too the country veterinarian is supposed by Mr. Greaves to be thwarted in his treatment and subjected to a variety of petty annoyances; such, of course, do exist to some extent, but I think generally that we receive both from masters and men a great degree of civility and attention, quite as much as we can reasonably expect.

And, finally, what can we say as to that most important subject, pecuniary remuneration. I think Mr. Greaves has put down much too low a sum as an average yearly income, but even were that sum doubled (and I do not think that country practitioners as a rule would average much less than from £200 to £300 per annum), it is but a bare remuneration for services, valuable in themselves, and done with an amount of labour that few can appreciate.

"THE QUESTION OF THE DAY."

By D. B. Howell, M.R.C.V.S., Reading.

Much has been said of late concerning the rise and progress of veterinary surgery as a science, and that others more competent than myself have investigated the question I do not attempt to deny. Still as the result of the discussion amounts to nothing, I should like to express a few opinions on the subject. In the first place, what is requisite to increase the status of the profession as a profession? The answer is—a very different connection among the members to that now actually existing, for to be respected by others we must first respect ourselves. "Vis unita fortior" is the proud motto of the college, but, with the exception of a comparatively few bright examples to the contrary, *disunion* is the rule, each individual, especially those in adjacent localities being at heart as eager to damage and malign his neighbour, as a terrier is to destroy a rat. In the medical profession it is the etiquette not to emblazon the shortcomings of a brother practitioner, but to tell him of any fault privately; yet in ours, let a second one be called in to any case, he is sure to condemn the treatment, however proper that may be, and perhaps better than he himself could suggest; or if to examine a horse, give an opinion contrary to the other. The status of the profession will never rise until as a body we have a different class of men than now constitutes it, men not afraid of dirtying their hands, nor above doing, instead of leaving others to do, what so often never gets done, to the loss of the employer and the suffering of the patients; men not dressed up like tailors' dolls, but in a style compatible with their station in life and vocation; for my experience convinces me that those who are so fastidious about dress, rings, and other affectations, have more brains on their backs than ever was contained in their heads.

How many are there among us who would prefer an attendant to run by their side, and if not to use a mantle, as did the courtier to the queen, at least to carry a sack to throw down when occasion required, to enable the dandies to walk over dirty places unsoiled. Mr. Greaves truly says, "the place of the veterinarian is the stableyard, not the refinement of a comfortable room." Then how are we to get better men? Have better education, not that miserable

apology which teaches a smattering of everything, without the rudiments of one, but a sterling well grounded system, so that the pupil may be as *au fait* on one subject as on another. At the present day the system of education is much too vast, too much is attempted, so little really taught; in fact, the mind of the majority is not sufficiently capacious to embrace the mass of ideas projected at the brain at one time, and the consequence is so many empty-headed ones drift out year by year with the so few really qualified. As a little knowledge is a dangerous thing, these empty-headed ones are those that do the harm in our profession, as well as in all others, not having the power to distinguish their own shortcomings, yet possessing impudence in abundance, which they freely use to the profit of self in maligning their neighbours, and covering their own incapability.

Teach the pupil what you please, but if that should only be a little, teach him that little thoroughly, as he will find as he advances in his profession, that there is always something yet to learn, proving the truth of a remark I once heard a gentleman (the late G. Montagu, Esq., the best judge of a horse we had in this neighbourhood) make in answer to a request to give his opinion on a horse, "I find now that the more I know about a horse the less I know." A step in the right direction has been made by opening Veterinary and Agricultural Colleges, and also that which has been instituted at Camden Town since I was a pupil, viz. a preliminary examination. Unless it is desired to perpetuate the principle of the Sunday schoolmistress, who called all big words "Jerusalem," let that examination be at once increased, and to a large extent to prevent the public knowing that the test employed as to the competency of a pupil for the study of the science and practice of veterinary surgery is exactly the same and identical with that passed by individuals desirous of serving at the same time their country and themselves as letter-carriers in Her Majesty's Post Office. Simple as are the requirements, I understand that, at least in one instance, a pupil was refused admission from failing to pass such an examination; consequently if it were increased time and money would be spared to the ignorant aspirant, and not so many rejected at their pass examinations. I consider that the pupil should attend one session at the Veterinary College *to be taught principles,* then serve two years with a practitioner *to learn practice,* at the end of the third year returning to college to finish his studies, and if competent at the time of examination obtain his diploma, which would do away with the objection raised in the leader of the present

(? past) month of teaching pupils theories which from previous practice they look down on with disdain. I have great objection to the course adopted at present in the admission of pupils at any time in the session, as I consider that due notice should be published of the time when it opens, *and under no circumstances whatever* would I admit any pupil when more than seven days have elapsed since teaching commenced. To learn to read one must first learn the alphabet; how then can a man learn anatomy, or any other of the branches, by joining a class already one third or one half through the subject, as these matters are too deep to be lightly run over, and the pupil who begins at the wrong end, never has that inclination to work step by step upwards, as does the one starting at the commencement? If practicable I would teach first session pupils separately from the senior ones. Carrying this out to the letter would of course decrease the income of the college, to provide against which, raise the entrance fee five or ten pounds.

With men heart and soul lovers of their profession, and enemies to quackery, the disjointed bundle would soon be bound together, and "vis unita fortior" would be our motto in reality and not in form, and the veterinary surgeon be respected as a man of science, and not, as is now too often the case, looked down upon as an humbug and a sham, in many cases arising in the first place from semi-ignorant men, when speaking of disease, using fine words which neither their employers nor themselves understand, and in many instances, using words applying to other diseases altogether.

A CASE FOR THE VETERINARY DEFENCE SOCIETY.

By Alexander Lawson, President, Bolton.

The Council of the Society met here on the 12th ult., to consider and decide upon the *first* application for aid from the Defence Fund, when they unanimously agreed that it was a case calling for their most strenuous support, both by means and advice. The particulars are briefly as follow:

A young practitioner in Ireland castrated a colt last spring. Tetanus supervened and the animal died in a fortnight. The owner has brought an action against the veterinary surgeon for the price of the colt. Now, my object in soliciting space for a few lines in your valuable journal, is to lay the case

before yourselves and the profession generally; and to ask of you and those of them who have had experience in such matters to favour me as representing the Executive of this Society with their best advice on this matter. Also to state whether they have had, heard, or read of any such case, and if so, where reported. Early attention will greatly oblige, as the case is to be tried on the 13th October next. There cannot be two opinions as to the great importance of the question at issue to the Defence Society and to the entire profession. The Executive of the Society hope for all the assistance and information which may be in the power of their brethren to give, and that promptly.

[We have some recollection of a similar action having been recently brought against a veterinary surgeon, who was, however, held not to be liable. The whole question turns in these cases, upon evidence of neglect or unskilful treatment. We all know that animals, and men too, die from tetanus after operations, in spite of all efforts which the most finished skill can put forth.—Eds.]

Pathological Contributions.

THE CATTLE DISEASE IN AMERICA.

For some time past a fatal malady known as the Texas or Spanish fever has raged among cattle in different parts of the United States. According to the accounts which have been published in the daily press, the malady was introduced by some Texas cattle which are not themselves obnoxious to the disease, but possess the extraordinary capability of inducing it in those animals with which they are brought in contact, or which may be feeding in pastures where Texas cattle have previously been lying. One theory is that Texas cattle eat a certain herb, which, although harmless to them, produces during its digestion a condition of the excreted matter which is fatal to other cattle. Another view refers the malady to a species of tick with which these cattle are much infested. Recently an impression that the disease is identical with rinderpest appears to have been entertained.

The subjoined statement, which appeared in the *Times* of

Sept. 10th, will be sufficient to negative the idea of the malady being in any particulars allied to the true cattle plague as we understand the term:—

"A *post-mortem* examination of a diseased cow at Cincinnati, made three hours after death, showed that decomposition had advanced as rapidly as is usual in three or four days. The membranes of the brain were congested, and dark patches of extravasated blood were found in the lining membranes of the heart. The liver, spleen, and gall bladder were enlarged, and the structure of the first very much softened. The first and second stomachs were also empty, the lining membranes greatly softened; the third and fourth stomachs contained dry and half-digested food. The greatest change was in the kidneys, which presented all the signs of high inflammation, and the bladder was greatly distended. The rectum and lower bowels were healthy, but in the coats of the small intestines were numerous black lumps, the size of small peas, the character of which could not be determined at the time. This animal had the tick parasites upon the skin, but these are not found in all cases. The disease, it is reported, is spreading from Cincinnati to other portions of the State."

A veterinary report upon the nature of the disease is much required, for at present everything relating to it is mysterious. We are not likely to suffer from the infliction of the pest upon our stock, considering the distance which separates us from the part where it exists, but it would be interesting to the profession here to know what the nature of the disease is, and in particular whether it belongs to the class of infectious and contagious maladies of cattle, or is merely of local origin.

Our importations of products of cattle from America are confined to hides, and as these are always prepared by being dried or salted before they are shipped, there is no risk of infection being conveyed to our shores through their agency, even if the disease proves to be infectious in its character. It has been suggested that the importation of hay from America is a source of danger; this, however, has been met by the Government, by an order passed September 15th, prohibiting the landing of American hay in the United Kingdom excepting under bond that it shall be used for horse-food only. The risk is not great, and unless the hay after being pressed were brought in contact with the virus of the cattle disease, it is difficult to see how infection could be communicated through the medium of the provender. The probability of the poison remaining in the grass, over which

infected cattle have grazed, after it has been cut and dried, is very remote. The amount of hay imported from America is comparatively unimportant, and its temporary stoppage would be of slight consequence. Nothing would be gained, however, by prohibiting the importation of hay from infected districts only. At present nearly all that is sent to this country comes from New York, but it is impossible to say how far up the country some of it may be grown.

RECENTLY REPORTED OUTBREAKS OF CATTLE PLAGUE ON THE CONTINENT.

In the early part of September a report was current to the effect that cattle plague had appeared in south Holland, and that twenty beasts had been slaughtered in consequence. Precautions were adopted by the Bavarian Government to prevent its introduction into that country, but no steps of a prohibitive kind have been taken by the English Government in the present doubtful state of the matter. The cause of the alleged outbreak has not been traced, and there appears good reason to doubt the fact of the disease being rinderpest. For nearly twelve months there has been no instance of cattle plague in that part of the country, and it is asserted that no reintroduction of the disease from an infected country is likely to have occurred. Under these circumstances, it is impossible to take the extreme course of prohibiting importation of cattle from Holland. Cattle from that country are now the objects of extra attention on the part of the officers of the Veterinary Department and also of the Customs, but up to the present no disease has been detected.

PECULIAR CONDITION OF THE SPLEEN IN A BITCH.

The following account of the abnormal appearances observed in a bitch is communicated by Mr. Andrew Spreull, veterinary student, Milngrove, near Glasgow. The malformation, or whatever else it may be called of the spleen, is, we believe, unique.

A few days ago, while engaged in making a *post-mortem* examination on a bitch which died of a gunshot wound, I met with what was to me a rather peculiar condition of the spleen. It is one which so far as my practical knowledge of anatomy leads me is of very unfrequent occurrence, and so

far as I am aware it has not been mentioned in any of our anatomical or pathological works, therefore I have ventured to send you a note of the case, so that, should you deem it worthy of a place in the *Veterinarian*, you are quite at liberty to insert it.

Post-mortem Appearances.—On making an examination two hours after death, I found the skin of the inguinal and perineal regions much discoloured and the vulva swelled. On removing the skin the subcutaneous tissue was exposed to view, deeply coloured with extravasated blood, and on cutting into the muscles of the crural region, one or two balls of shot were found which confirmed the diagnosis as to the cause of death. On laying open the internal cavities of the body, the whole of the contained viscera, thoracic and abdominal, appeared to be in a healthy condition, except that on slitting open the intestinal tube its mucous membrane, from the middle of the duodenum about the entrance of the ductus cholidicus to the end of the single colon or beginning of the rectum, was coated with extravasated blood, which appeared as if it had resulted from an internal hæmorrhage due to the passage of a portion of the shot into the intestine; this, however, I was unable satisfactorily to demonstrate.

The chief peculiarity, however, to which I mean to direct your attention is the condition of the spleen. This organ, so far as I am aware, has formerly only been single, but in this instance it was distinctly double, situated in the natural position in the left hypochondriac region, in close proximity to the stomach, and attached as usual to it by the gastro-splenic omentum. The two portions or organs were about two inches apart, joined only by blood-vessels, nerves, adipose tissue, and omentum. The one was somewhat the shape of the letter D, approaching, perhaps, a little closer to the circle, and being about two inches and a half in diameter. The other was pear-shaped, and marked by a transverse line or marking which gave it a lobulated appearance; this one was about three and a half to four inches long, and two inches broad at the base, tapering down to a blunt point which formed the apex.

They both appeared to be in good healthy condition, and bore no traces of any disease or lesion which might through accident or otherwise have led to section of the organ at any former period. I may further mention that the animal was an old one, and that I am unaware of its having shown any signs of disease or other disturbance of the general system previous to the date when she came under my care, viz., the day previous to her death.

DEATH OF SHEEP FROM EATING BARLEY.

We are informed that a serious loss has recently been sustained by Mr. Rowles, Manton, Wilts, through the turning of a flock of sheep into a barley stubble.

It appears that the animals ate very greedily of the stubble and scattered corn, and that on the following morning very many of them were found to be seriously ill. Notwithstanding early medical attention was given to the cases, seventeen of the animals died in the course of a few hours. Our informant does not state the nature of the lesions which were observed *post mortem*, but that the examination fully proved over feeding to have been the cause of death.

MALIGNANT APHTHA IN LAMBS.

Mr. E. Taylor, M.R.C.V.S., Bury St. Edmunds, informs us that he has under his care a flock of three hundred lambs, a large proportion of which is suffering from a malignant form of aphtha. Many of the animals are affected to an extent to prevent their taking food, and one had died before he was called to the cases. The lambs had been bred on the farm, and the outbreak could not be traced to any special cause, although probably it depended on something which the animals had partaken of as food. Saline aperients followed by the free use of antacids, and the topical application of astringents and antiseptics, proved very beneficial in many of the worst cases.

CANCEROUS DEPOSIT IN THE KIDNEYS OF AN OLD HORSE.

Mr. Gowing has lately forwarded for examination a specimen of the urine and also a portion of the kidneys of a horse, twenty-seven years of age, which had suffered from disease of the urinary organs for a long period. About a year ago, the animal's urine was observed to be very dark in colour, but he performed the small amount of work required of him without distress, and maintained his usual health. A month ago a quantity of blood was discharged with the

urine, and a few weeks subsequently another attack of hæmaturia occurred and continued for several days; the appetite, however, was but little affected; there was no tenderness on pressure to the loins, nor excepting a slight cold was the animal at all out of health. From the history of the case, however, it was decided that organic disease of the kidneys had existed for some time, and as the horse might fairly be considered to be worn out by a quarter of a century of service, it was decided to have him destroyed. On *post-mortem* examination the special morbid appearances were confined to the kidneys, other parts of the urinary organs being perfectly healthy.

The urine was dark red in colour, and deposited a quantity of calcareous matter. Examined microscopically, it was found to contain numerous crystals of carbonate of lime, and also abundance of blood-corpuscles. No other adventitious products were detected, and it may be said that the examination of the urine in this case afforded no evidence of the nature and extent of the organic disease.

The kidneys were normal in size and colour externally, but in making a section through them, a very marked morbid change was apparent. In the medullary portion the structure was much broken up, the general colour was yellowish white streaked with deep red. The apices of the cones were softened, and in some parts semifluid. Under the microscope the usual elements which are observed in encephaloid tumours were found in abundance, the major portion of the cells were caudate, but many large nucleated cells were also detected.

It would appear from the condition of the parts, and also from the animal's history for some time back that the gradual disarrangement of the texture of both kidneys is compatible with a moderate degree of health, and a capability of undergoing exertion. It is probable that the affection is more common among horses than has been hitherto suspected, as three well marked instances in Mr. Gowing's practice have been brought under our notice in the last few months.

Facts and Observations.

Tenacity of Life in a Lamb.—A singular circumstance occurred very recently at Royden, Essex, which showed how long animal life may be sustained without food. In the

second week of July the flock upon a farm was counted, and one lamb found to be missing. Search was made, but nowhere could the lost one be discovered. In the first week in August, three weeks and three days after the lamb was lost, a well-digger was called in to inspect a dry well some forty-six feet deep, which had been recently dug upon the premises, with a view of sinking it deeper, when much to his astonishment the long-lost lamb was found at the bottom. It had broken its shoulder in the fall, but was otherwise unhurt, and when brought to the surface it immediately ran away upon three legs, and commenced feeding, apparently much delighted at its most miraculous escape.

Structure of the Touch Corpuscles.—M. Ch. Rouget comes forward once more with a memoir on the structure of the touch corpuscles and the corpuscles of the conjunctiva. He states that he has arrived at results quite different from those of Kölliker and Lüdden. On examining the conjunctiva, previously deprived of its epithelium by maceration in dilute acid, M. Rouget discovers, in groups, numbers of small rounded bodies which are attached, like seeds, to nerve-tubes with a double contour. The nerve-tube which forms the peduncle is, as it were, rolled round a spheroidal mass of granular substance. This latter is highly refractive, and contains oval nuclei. If, he says, we suppose the nerve-tube unrolled, then this central mass would present itself as an expansion of the axis-cylinder of *Purkinje*. M. Rouget totally denies the existence of the capsule described by Krause and Lüdden. He asserts that in some cases the nerve-tube is coiled round the central mass as many as nine or ten times.—*Med. Times and Gaz.*

Function of Nerve-Cells.—The question of the respective functions of the unipolar and multipolar nerve-cells has been partly taken up by M. J. Chéron, who, in a recent contribution on the structure of the ganglia in cephalopoda, states it to be his conclusion, from various experiments, that the multipolar cells are those alone engaged in reflex actions, whilst the unipolar cells have no such office, but appear rather to be centres of nervous force.—*Ibid.*

The Existence of Copper in the Organism.—The existence of copper as a normal constituent of the body has been often asserted and as frequently denied. Quite recently, however ('Comptes Rendus,' lxvi, No. 12), M. Chevreul calls attention to a letter received by him from M. Nicklès, in which the latter points out the source of the copper which has been discovered by so many investigators. "The error,"

says M. Nicklès, "results from the use of a Bunsen's burner with a copper tube in the incineration of the organic matters." We believe that M. Lossen's experiments fully corroborate M. Nicklès' opinion.—*Ibid.*

Inoculation of Cancerous Matter.—It would appear from the experiments of M. Gaujon, mentioned in the *Gazette Hebdomadaire*, that he succeeded in causing not only the appearance of a cancerous tubercle on the skin of a guinea-pig inoculated with the matter of epithelioma, but also an eruption of the same morbid manifestation on the mucous surface of the intestinal canal.—*Lancet.*

Fungi in Disease.—At a recent meeting of the Pathological Society, the President announced that he had received from Professor Hallier, of Jena, the observer who last year published the statement that he had traced a constant connection between cholera and the existence of a certain fungus in the intestinal canal, a letter, in which he communicated the fact that he had established, as he believed, a connection between six diseases and different species of fungi. These are, variola and the allied diseases, variola ovina and vaccinia; measles, typhus, and typhoid fevers. In the three latter the fungi were discovered in the blood. In the three former Mr. Simon presumed that the fungi were found in the vesicles or pustules. This fact was stated to have been verified by the examination of specimens taken from different sources and in different epidemics. If confirmed, it is difficult to overrate the interest and value which attach to it.—*Med. Times and Gazette.*

Production of Disease by Fungi.—Dr. J. H. Salisbury, who, it will be remembered, a year or two ago announced that he had discovered a connection between certain palmelloid cryptogamic bodies, which he named "ague plants," and intermittent fever, now publishes, in the January number of the 'American Journal of the Medical Sciences,' that he has observed two new algoid vegetations, one of which he believes to be the cause of syphilis, and the other of gonorrhœa. The *Crypta syphilitica* he describes as a minute, transparent, highly refractive algoid filament of uniform structure, having the extremities obtusely rounded. They are developed from spores, and may be straight, coiled, or arranged in curves. Dr. Salisbury states that he has found these filaments in the bed of chancres and in the blood of persons affected with secondary syphilis. The *Crypta syphilitica* finds a fertile soil in the connecting tissues. The

Crypta gonorrhæa, also an algoid plant, having a filamentary form, according to Dr. Salisbury, is limited in its invasion to the epithelial tissue, whilst the *Crypta syphilitica* is mainly confined to the connective, cartilaginous, and osseous tissues. Several figures of these algoid vegetations are appended to Dr. Salisbury's paper.—*Ibid.*

Arsenic in Cast Iron.—Two instances are recorded of the presence of arsenic in considerable amount in cast iron, both being in shot and shell of Turkish origin, those brought from Sinope containing 16·2 per cent.; while of others found in the arsenal at Algiers, on the French occupation in 1830, the shells contained 9 per cent. and the shot 27 per cent.

The consumption of iron ores in the United Kingdom is, in round numbers, about 10,000,000 tons. The relative proportions of the different minerals are as follows:—Argillaceous and blackband ores of the coal measures, 42 per cent.; Cleveland ores, 28 per cent.; red hæmatite, 15 per cent.; brown hæmatite and limonite, 13 per cent.; spathic and foreign ores, 2 per cent.

Opium in Victoria.—A successful attempt at growing opium has been made in this colony. A few plants have been raised this year, and the produce has been pronounced by good judges to be of first-rate quality. The Chinese horticulturists in these districts will no no doubt avail themselves of this experience, and it is expected that opium crops will be largely cultivated.

THE VETERINARIAN, OCTOBER 1, 1868.

Ne quid falsi dicere audeat, ne quid veri non audeat.—CICERO.

ON THE NECESSITY FOR SYSTEMATIC INSTRUCTION IN THE DETAILS OF PRACTICE BEING MADE AN ESSENTIAL PART OF THE CURRICULUM AT VETERINARY COLLEGES.

"ONE fact is worth a thousand theories," said or wrote some one whose name and status we do not at the moment recollect; but, whoever may be responsible for the sentence, a more unphilosophical assertion never found expression in any language. The maxim is just one of those authoritative, dogmatic, *ad captandum* utterances which are wont to impress by their very terseness, and to excite admiration on account of their didactic character. A moment's thought will prove how impossible it is to draw comparisons between the value of facts and theories, relating as each do to entirely different conditions. Some facts are of no appreciable value at all, and certain theories have been the forerunners of facts of vast importance. The general acceptance which is accorded to pretentious formulæ is unfortunate because the intellect, fettered by an adherence to such apparent truisms, is fain to rest content with their limited teachings, and even to oppose wholesome innovations, merely because they are antagonistic to established convictions. In every comprehensive scheme of education facts and theories must play their essential parts, and the student who fails to comprehend at the beginning the exact relation which these two hold to each other, leaves unlearned the alpha of his studies. Scientific tuition in the present day, perhaps, too frequently ignores or neglects the practical in its endeavour to advance in the speculative, seeking rather to inculcate the importance of knowledge than the necessity for work, and attaching more value to the capacity for acquiring than to the aptitude for doing.

The favourite system of teaching furnishes an apt illustration of the tendency to which we allude. Of the many who comprise a class in a medical school, let us say a Veterinary College as more to our purpose, what proportion would prefer the actual work of the laboratory or the infirmary to the less laborious act of sitting in a theatre and listening to the well-digested and carefully condensed remarks of the lecturer. Doubtless the lecture system is a most valuable method of tuition under certain essential conditions which apply, if not to every department of knowledge, certainly to the one which we have particularly to deal with. Lectures deservedly are in very general favour, and when well delivered, with all the adjuncts of a ready and eloquent speech, and an emphatic manner, they entertain perhaps as much as they instruct, and require for their comprehension the minimum amount of attention from the conscientious student. Under all circumstances the lecture system is admittedly the most luxurious mode of acquiring knowledge, but in proportion to its facilities its results are unsatisfactory, and we appeal to the experience of every teacher of science, whether it is not possible for a certain proportion of the class to attend regularly every lecture of a course, not only without obtaining a full knowledge of the subject, but even without gaining a general idea of the nature and objects of the science of which the facts and principles have been day by day expounded in their hearing. A want of previous training may hinder the comprehension of the matter of the lectures, unfamiliar terms may perplex the mind, and a slowness of perception may make it impossible for the student to follow the speaker's reasoning with the necessary readiness. To the well educated and persevering student all these difficulties are scarcely appreciable; he alone gains the full benefit of this suggestive system of teaching, because he knows how to fill up the outline which is sketched by a master hand for his guidance; but even under the most favourable circumstances, the tuition of the lecture theatre fails entirely to convey such qualifications as manual tact and dexterity. These must be acquired by practice, and in learning to do, it may be that the previously acquired

knowledge of how the thing should be done, proves to be at first worthless or even obstructive.

This much is conceded without hesitation, and without the slightest idea that our consistent advocacy of an improved education for the Veterinary student will be in any wise damaged by it.

We know that in many circumstances there will arise a happy confidence in the mind of the ignorant which may insure success in a dangerous operation while failure may result from the less decided measures of the more reflecting. Not for this reason, however, do we prefer the blindness which haphazard stumbles upon the right way, to the clear and penetrating vision which by accident may fail to distinguish what it seeks, and fall by chance into the error it should have avoided.

Let it even be granted that the highly cultivated scientific man views with distaste the drudgery of his profession, is that a sufficient reason for neglecting the details of his everyday duty? is it because a certain thing is difficult or irksome, that therefore it should not be done? Is it anywhere taught that what a man delights in, that only shall he do? The real question after all is, what is best for the individual to know and do? And this being decided, the next thing is to settle the manner of teaching what it is determined shall be learned, under the full conviction that whatever is well learned and efficiently done, is certain to bring satisfaction in time, however distasteful it may seem at first.

Setting aside, then, for the present, questions of taste, which appear foreign to the argument, we contend that there exists a necessity for a more extended scientific education for the veterinary student; and, in addition, a perfectly independent system of tuition in the details of practice. It is impossible not to feel the force of the objection which is constantly urged against the newly-qualified veterinary surgeon, that with all his college learning he cannot bleed a horse or give a cow a drench, to say nothing of a hundred other common qualifications in which he is deficient from mere want of opportunity to acquire them.

A department of veterinary practice must be established

at our veterinary schools before the want, which has long existed, will be met. The manner of working out the scheme may safely be left to the authorities who preside over Veterinary educational institutions, but our idea is that it should be conducted by an officer whose whole time should be devoted to practical teaching, and that it should be his special business to see that every student of the class intrusted to him should be made familiar with the routine of examinations as to soundness, inspection of sick animals, administration of medicines, surgical operations, all of which could be performed on the dead subject, and afterwards any of them which might be required, if the opportunity occurred, on the living animal.

Without advocating the association of the profession of a Veterinary Surgeon with the trade of horse-shoeing, we see the desirability of the practitioner being able to take off and put on a shoe, as without the power to do this safely and well it will be impossible for him to examine or operate upon a diseased foot without getting the assistance of a farrier who may not be conveniently at hand, and in country practice would more frequently than not be quite out of reasonable distance.

Students should not be allowed to attend the practical classes until they had acquired a certain fixed proficiency in the science of their profession, probably the third year of their pupilage would be the best period.

An additional year thus spent would well repay those who employed the time properly, and it would not be long before the profession would be benefited in every sense by the change.

When the experiment shall be tried, if it does not turn out that the most assiduous worker in the dissecting-room and laboratory, the most attentive listener in the lecture-room, and the most finished scholar of the class, is also the most laborious worker in the infirmary and ultimately the best operator and the cleverest practitioner, we shall, in Eastern phrase, "eat dirt," and confess ourselves miserably mistaken.

Reviews.

Quid sit pulchrum, quid turpe, quid utile, quid non.—Hor.

Principles of Organic Life. London: Robert Hardwicke, 192, Piccadilly.

(*Continued from* p. 628.)

In the September number of the *Veterinarian* we criticised the first part of the book which has been published anonymously under the above title. The extracts which were given afford a fair illustration of the author's views of physiology, and it only remains for us to examine that portion of the work which treats of the application of the new principles to the practice of medicine; in this department of the subject we are bound to admit that the author has the game very much in his own hands, because he mainly contents himself with exposing the fallacies and inconsistencies of the medical art as at present practised. The same thing has been done over and over again by the supporters or originators of a new system. The homœopathist, for example, revels in the delight of a violent onslaught upon the bleeding, purging, and blistering system of the old school, and becomes sublime in dignified laudation of the benignity of the new method, which consists, to ordinary minds, in the idea of doing nothing, or approaching as nearly to that unobtrusive system as may be.

The author of *Organic Life,* however, deals even-handedly with all systems by quietly superseding each and all of them with his own peculiar notion of the value of manure which each animal carries about with him in his intestines. After the distinct statements which he makes in the first part of the work of the paramount value of *fæces,* it is fair and consistent that he should absolutely rave against the violent and premature removal of this important regenerative material by means of purgatives. Constipation he looks upon as a bugbear, and the attempt to overcome it as a deadly and destructive interference with the "ars medendi naturæ." His arguments are supported by appeals to facts which are familiar to all medical men who have met with instances of the bowels being locked up for long periods without the occurrence of those ill consequences which are commonly anticipated.

The writer commences by asking the question, "What is disease?" and in response says "We cannot answer the question without first believing that nature is always endeavouring to uphold an equilibrium of all her stores, which are many, and, moreover, of a very adverse character, and acting in order to produce a constantly healthy standard in every part.

"As long as these actions go on with the greatest integrity and regularity, according to each person's idiosyncrasy, we have what is called health in that individual."

In commenting upon the natural methods of cure in the course of which the animal system either appropriates or endeavours to expel any excess, or conserves and retains when there is a deficiency of vital forces, he remarks:

"Man comes in again, and says, 'I cannot allow this; nature is acting contrary to all her own laws and all our dogmas; and, forsooth, all our authorities are outraged. This is a disease of such and such a type, and I must force those actions which we see performed in health, but which are now in abeyance.' So in both cases he must necessarily interfere with the progress of natural cures. Therefore it seems evident that that which man thinks and believes to be disease is only nature's efforts to rid herself of elements of excess, on the one hand, or by retaining them, on the other, because they are wanted to make deficiencies."

Further, at page 152, the author gives us some idea of his notions about the natural method of treating disease:

"If physicians would observe these facts they would see how nature behaves in her endeavours to restore the lost power. She husbands every secretion, she checks every inordinate action; she locks up and conserves the elements in the colon, in order to get hydrogen gases to resist the wearing influence of the oxygen; and she does this to make fluid inorganic elements; thus storing her self-supporting principles and powers, to get from all these resources elements which have been lost."

With this statement before us, in addition to those which have been before enumerated in the first part of the work on the subject of the individual's obtaining organised elements from the manure in his colon, we are not surprised to find that all the recognised methods of treating disease are condemned as mischievous. In reference to cattle plague we are told, at page 159—

"The description of the disease is perfect. What does it lack, then? Only two things—its physiology and treatment. At present there is nothing but what is either false in the

one or pernicious in the other; yet they are capable of being resolved into the most marvellous simplicity."

The marvellously simple system which ensures success, seems to be comprised in the administration of opiates, with mineral acids and metallic tonics; in one instance an entire herd was saved by these means. In our own experience unfortunately an opposite result has followed exactly similar treatment, the difference doubtless being that the treatment is successful when the disease is not present, and always fails when it is, and this may be said of every other method that has been tried for the cure of rinderpest, notwithstanding that our author states his conviction that the disease "is as capable of being cured as the measles." Everywhere in his book the writer is firm in his denunciation of purgatives in those diseases for which they are usually employed, and up to a certain point there can be no doubt of the evils which result from the injudicious administration of aperient drugs. Whether their wholesale condemnation should follow upon this admission is not satisfactorily determined. *The Principles of Organic Life,* both in physiology and pathology, is a singular book, and one which we commend to the members of the veterinary profession. Its perusal must arouse thought, and our present system of medicine is not established on so firm and logical a basis as to justify a contemptuous disregard of novelties. We lay the book down with a half-formed determination to "throw physic to the dogs," and horses, we may add—at any rate to "have none of it" ourselves for the future.

A Practical Treatise on Parturient Apoplexy or Milk Fever in the Cow; to which is added a Treatise on the same Disease in the Sow. By Garwood George Whincop, M.R.C.V.S. Lowestoft: Arthur Stebbing. Norwich: Fletcher & Son.

The disease which forms the subject of Mr. Whincop's essay is remarkable for its fatality, and any information upon its causes and treatment will be thankfully received by agriculturists. The author states on the title-page that his treatise is divested of all technicalities, being intended for the use of the farmer and cowkeeper; accordingly we do not find any learned dissertation upon the primary impressions on the peripheral extremities of the sensient nerves, nor are the functions of the excitor motory system enlarged upon;

instead, however, we have a plain description of the parts which are implicated in the disease, and a distinct statement of the symptoms and *post-mortem* appearances, with suggestions for treatment. Mr. Whincop deals with the subject in a manner which proves him to be practically acquainted with what he discusses. His views of the pathology of the disease he avers to be those which he first adopted under the tuition of our colleague Prof. Simonds, of whom he writes,—

"It fell to his lot to point out to us the error that for years we had been fostering, and placed the disease now under consideration before us in a new light; he showed us plainly that the disease was centred in the brain and nervous system; and veterinary surgeons wondered how for so many years they could accept such a false idea as the former one." Although Mr. Whincop has thought fit to treat the subject in a popular rather than in a scientific manner we hail the essay as a contribution to our very meagre literature in the department of cattle pathology.

The Microscope and its Revelations. By William B. Carpenter, M.D., F.R.S., &c. &c. Fourth Edition. London: John Churchill and Sons.

In noticing the fourth edition of this most useful and carefully compiled book, we cannot give our readers a better notion of its objects than by quoting a few passages from the Preface. Our author says "The rapid increase which has recently taken place in the use of the microscope, both as an instrument of scientific research, and as a means of gratifying a laudable cnriosity, and of obtaining a healthful recreation, has naturally led to a demand for information, both as to the mode of employing the instrument and its appurtenances, and as to the objects for whose minute examination it is most appropriate. This information the author has endeavoured to supply in the following treatise, in which he has aimed to combine, within a moderate compass, that information in regard to the use of his instrument and its appearances which is most essential to the working microscopist, with such an account of the objects best fitted for his study as may qualify him to comprehend what he observes, and thus prepare him to benefit science whilst expanding and refreshing his own mind."

The first portions of the work contain chapters on the "Optical Principles of the Microscope;" "Construction of the

Microscope;" "Accessory Apparatus;" "Management of the Microscope;" "Preparation, Mounting, and Collection of Objects;" these are followed by chapters on the microscopic examination of minute animals and plants, as well as that of the structure of the tissues of these highest in the scale of organisation. The two concluding chapters are on the "Application of the Microscope to Geology," and "Inorganic or Mineral Kingdom;" "Polarization."

Dr. Carpenter, therefore, deals with the three kingdoms of Nature, and thus accomplishes the object he had in view in publishing the present work, namely, to treat his subject in as general a manner as possible, leaving it for Dr. Beale, Professor Brown, Dr. Hassall, and others, to furnish us with works on the applications of the microscope to pathology, the detection of adulterations, and other special subjects. That the book is profusely illustrated, notwithstanding its exceeding cheapness, will be evident when we state that among the 796 pages of which it consists there are no less than twenty-five plates, and 412 beautifully executed woodcuts, illustrating the descriptions contained in the accompanying letter-press.

For a general treatise on the microscope there is no work in the English language at all comparable with Dr. Carpenter's; and we have, therefore, both confidence and pleasure in recommending it to the use of our readers, who employ the instrument as an aid to investigation, or as a means of obtaining recreation which instructs while it amuses.

Extracts from British and Foreign Journals.

TOWN MILK. By John Chalmers Morton.

(*Continued from p.* 575.)

"In Marylebone (at Mr. Drewell's, Upper Weymouth Street) you find in a good street, a corner shop, where the side road leads to a well-kept first-class mews. The master takes you through his three-storied cowhouse, as you may call it—and first into an apartment of twelve or sixteen cows, which is the quarantine station through which after some weeks' trial, they pass into the other rooms, one directly overhead reached by a sloping gangway, and the other along-side but lower down. The floors are all closely bricked in cement, the upper one being laid on brick arches, and the drainage is everywhere perfect. Nowhere are there better, cleaner, neater, and

sweeter cowhouses than, taking these examples as an illustration, may be kept and are to be found in London streets.

"Lastly, I come to the larger establishments, where 200 cows and upwards may be milked. And here, too, you find two classes of establishments —houses, on the one hand, where you can touch the ceiling, dark and dirty, and crowded with unfortunate beasts; or where, in spite of ample space and lofty roof, the poor cows are comfortless and filthy—and places, on the other hand, where the accommodation is first-rate, roomy, clean, and comfortable—a single cattle-shed, it may be, like Mr. Camp's, in St. Pancras, in the midst of a large and roomy yard, ninety yards long and twenty-six feet wide, with a broad gangway between two rows of cattle—or several sheds, clean, dry and warm, each well managed, placed at intervals in a clean and spacious yard, such as Mr. Veale's first-rate establishment, in the Acacia-road, St. John's Wood.

"Such, then, are the London cowhouses, of many sizes, and of at least two styles of management, in one of which a daily cleansing of the whole establishment, dung-pits included, insures perfect order and condition; and in the other, muddle and dirt easily create a nuisance."

To this I add a short description of the cowhouses erected on the Barking Farm to which I have referred, which are complete and satisfactorily equipped cowsheds. They were designed by Mr. James Avis, one of the clerks of works employed by the Metropolis Sewage Company. Intended to hold sixty cows, with room for fodder, shed for grass and roots, pit for grains, well, tank for urine, safety for tools, and sleeping apartment for men, they are boarded buildings 120 feet long and 26 feet wide, 10 feet high to the eaves, with boarded and felt-covered roof. The beams, morticed into uprights at 2 feet below the eaves, are 7 feet 9 inches from the ground, and carry a floor along the middle about two thirds of their length in width, and extending the whole length of the building, except in the central shedding for grass, which is open to the roof. The cows stand back to back, the mangers lying along the sides of the building, and a central gangway, $5\frac{1}{2}$ feet wide, lying between the two rows. The space is thus open to the roof above the heads of the cows, and there is ample ventilation, by means of flaps under the eaves, louvre ventilators in the ridge, and open doors at either end. The sleeping-room for the men—a space about 15 feet square—is boarded off from the upper flooring, which is used for storage of hay and straw.

Near the middle of the house—fourteen pairs of cows being on one side and sixteen couples on the other—boarded up so as to make two separate cowhouses on each side of it —is the shed for grass and roots, 15 feet wide. Underneath one corner of it is the well and pump, and in the other the grain-pit. Here, too, is a lock-up for the tools employed. Into this shed the carts are backed and tilted, and the food —grass or roots—lies stored here, midway of the cattle which

are to consume it, so as to economise the labour of distributing it. The whole surface covered by the roof is laid out for the most part with a common brick floor or concrete. A tiled drain runs down the middle, 2 feet deep, to take the urine to the tank at one end of the building. The mangers along each side of the building are about a foot off the ground, brick-built and cemented, so as to be fit for holding water as well as food. They are about 2 feet wide and 6 inches deep. A pump, drawing from the well, is furnished with a moveable spout, so that each of the four sections into which the mangers throughout the building are divided may be supplied with water in succession. The cows stand two and two in 7 feet stalls with short wooden divisions. The lair next the manger is rammed earth; the latter half of its length is a brick floor. It is 6 feet 3 inches long (from the manger to the gutter), and there is a drop of 4 inches into the gutter, which empties at intervals into the central drain. The gangway behind the cows and between the two gutters is $5\frac{1}{2}$ feet wide; and in this central gangway a wooden tramway is sunk flush with the brick floor, on which a truck runs from one end of the shed to the other, and is used to collect the dung when the shed is being cleaned, and to carry it to the manure stance at the further end near the tank. The cows are secured by neck-chains and sliding-rings to long upright iron staples in the posts, each on its own side of the double stall. The whole thing is compendious, not very expensive (costing about £4 per cow), and economical of the labour performed in it; and this is a very important consideration.

Health of the Cow.

The treatment of the cow has thus been discussed under the several heads of food and water, regular and gentle attendance, and accommodation, including reference to its lair, and to the ventilation and warmth of the air it breathes. And on these particulars, if the cow be free from illness when she is bought, her health depends. Bnt she may be purchased with the seeds of disease already implanted, and she may thus bring disease to others as well as suffer it herself. Generally the first symptom of any impending attack is a diminution in the milk. Mr. Mosey, of the Albion Dairy, Barnsbury, tells me that he has long been in the habit of daily recording the milk of every cow, just for the sake of having this indication brought immediately under his attention. And the cowman who is constantly in attendance on

a dozen cows of course at once detects a failing of this kind, whether he records it or not. The loss of milk sometimes appears even before a loss of appetite. In such a case, when the cattle plague has been about, the rule has always been immediately to send the cow to market; and even now, if the cow is half fat, it is the best policy whenever, if guided by these symptoms, the owner believes a serious attack of any kind to be impending, to sell the cow at once. For the avoidance of disease, and even it is believed for the cure of it, when only the germ exists, it is a good plan in the case of all newly bought cattle to give a drench of 1 ounce of nitre in a quart bottle of water, into which 4 ozs. of flour of sulphur have been well shaken. I have known dealers of large experience thus drench all their cattle immediately after leaving the fair where they have been bought; and there are stock-owners who invariably give this drench at spring and fall of the year, when a change of food is general; and in both cases it is said that great advantage is derived in the consequent freedom from diseases such as foot-and-mouth disease, which are picked up in markets, or happen at the change of the season. And the practice may, therefore, be recommended to any one who is buying country cows for a London cowhouse. Of course, when your stock is attacked by any malignant disease like cattle plague, there is no help for you in any such expedient as this. I have gone through an experience of this kind, 127 cattle out of a herd of 238 having been slaughtered on the Barking Farm in August last year, owing to an attack of cattle plague. Here the only safeguard for any neighbouring cows is entire seclusion. Refusal of admission to strangers when any infectious disease is near is the only hope of avoiding it. Daily sprinkling with chloride of lime along the gangways after they have been cleansed, hot lime thickly spread in all entrance ways through which those going to and fro must tread, and, above all, a strict quarantine, must be insisted on. Two of the cowhouses on the Barking Farm, containing 111 cows, were thus saved while the cattle plague was raging in the homestead and in other sheds along the thoroughfare only 300 yards away; and I have no doubt that the safety of these was owing to the entire isolation in which for a month they were kept. The attendants on these cows, whether men or horses, were refused access to any other part of the farm for that time, and the cowmen were strict prisoners for a month.

Before referring to the produce of the cowhouse, and to the quality and quantity of the milk obtained in it, it is proper very shortly to insist on the essential need of cleanliness

This, though especially required in the dairy, is desirable everywhere. The cow, like all other animals, is the happier and more healthy for it. The dairy vessels must, of course, be clean; the pails must be scoured and rinsed after every milking. The milk is poured from them through a strainer at once into the can or "churn," which stands ready to receive it at the cowhouse door; and in a suburban farm it is at once lifted into the spring van which takes it directly up to town. Or in the case of a farm farther afield, the churn is placed to stand in water, and its contents are cooled down before being sent away. These "churns" must be scalded and rinsed after being emptied at the dealer's; and when returned to the farm they must be again scoured, and scalded, and rinsed, before being used. There is a boiler in the washing-house on the Lodge Farm, Barking, with a steam-pipe from it lying along the floor, and steam-jets rise from it. After they are scoured the churns are put upside down over these, and receive a very thorough final cleansing by a jet of steam playing thus for four or five minutes within them. They then stand on an open floor in an open shed to drain and cool, and are fit for use. Cleanliness and coolness are essential things. Having these, and providing as rapid a transmission as possible, the consumer will receive the milk, such as it may be, at its very best.

The Milk Produce.

What this milk is, however, depends upon the cow and the treatment of her, to which we have been referring. The milk of every cow has its own natural standard of quality, but taking the case of each apart, her milk is rich or poor, *first*, according to her nearness to the time she calved; and, *secondly*, according to the quality of her food. The milk of a big, ordinary cow, bought half fat for a London cowhouse, will throw up 14 to 16 per cent. of cream in three hours in the lactometer during the first few weeks after calving; and the same cow similarly fed will not yield much more than half so good a quality, when after six or eight months' milking she is rapidly diminishing her quantity. At an equal age, however, at the pail, the London cow, fed so as, if possible, to maintain or increase her flesh, will yield a richer milk than a country-fed cow, which is being milked at grass. The way to keep a uniform quality when, as in London, a great part of the food (grains and hay) is constant throughout the year, is to keep buying in fresh cows in pretty constant numbers throughout the year. But, except in the poorer districts, where the demand for milk does not vary through-

out the year, this is not commonly done. A London cow-shed, in the west-end, for example, is full only during the spring and summer months when London is full. And as it is then that a richer milk is wanted for the sake of the cream which is required at "good houses" during the season, that is the proper time to buy in freshly-calved cows. And, as the quotation given at the outset of this essay proves, dealers do not scruple to take a portion of the cream it throws up, and even to add water before selling the thus manufactured article as new milk.

As regards the average quantity of milk yielded by a cow, under the circumstances of a London cowhouse, I have been told that this very dishonesty is sometimes a difficulty in the way of obtaining trustworthy information. The small cow-man who, by adding water, sells more than his cows produce, will, it is said, report a yield larger than the truth to cover his roguery.

At many small cowhouses which I visited two years ago I was told that 11 and even 12 quarts a day are obtained on an average throughout the year; that is to say a house of ten stalls always full will yield $10 \times 365 \times 11$ quarts of milk per annum, which is equal to 40,150 quarts, or 1000 gallons per stall. If, as is probable, these cows are changed every eight months on an average, then 10,000 gallons is the quantity yielded by fifteen cows during the eight months after calving, before they are sold. Each cow, therefore, yields 666 gallons in its eight months' milking. This, though a large quantity, is not incredible. In the case of the Frocester Court Dairy (Gloucestershire), of which a full account has been given in the *Bath and West of England Journal*, Mr. Harrison (now one of H.M. Rivers Pollution Commissioners) found that of his 104 cows, 8 in the first year of milking (calving at two and a quarter years old) yielded 317 gallons per annum; 15 also in their first year (but brought to the pail at three years) yielded 472 gallons; 14 in their second year averaged 535 gallons; 15 in their third year averaged 616 gallons; 20 in their fourth year made 665 gallons apiece; 18 in their fifth year yielded 635 gallons; 9 in their sixth year made 708; 15 aged cows averaged 651 gallons apiece. These figures, however, give only an approximation to the truth, if they be taken to indicate the average yield of milk of a cow at different ages; for doubtless in a large herd like that of Frocester Court the bad milkers, which would keep down the average of the first or second year, would be culled out, so that only the better cows would remain. It is cows in their third, fourth, fifth, and sixth years of milking

It is to comparative anatomy that we must look for the solution of this problem, which has so much occupied the physiologist. Comparative anatomy shows an evident vascular correlation between that portion of the digestive tube in which digestion is principally performed and the arteries of the spleen.

If we admit that the spleen is an organ which produces the red globules of the blood, it would certainly fill an important office in the animal economy. The fact is that the red globules constitute the vital part of the blood, and life could not continue in their absence. The spleen being extirpated, they would infallibly perish in a short time; but then the red corpuscles exist in the blood of the embryon before the spleen and thyroid gland are formed.

It is easier to understand the continuation of the health in animals which have been deprived of the spleen, by considering the spleen and the thyroid, &c., as derivatory organs. The derivation of the blood is not an act essential to the life of the animal; it is only accessory. When the spleen is removed the blood, of course, ceases to flow through the splenic artery, and directs its course to the hepatic arteries, which divert the blood from the arteries of the stomach, and the health of the animal does not suffer.

We are not more advanced in the knowledge concerning the thyroid gland. This organ being accessible to the sight, it is not necessary to lay it bare to observe the numerous variations which it may undergo in its volume. We are every day in a position to observe amongst the women of the labouring classes who carry heavy loads on their heads, also amongst women in the act of parturition, enormous enlargements of those organs, consequent on the efforts to which nature has subjected them. Bardeleben addressed, in 1854, a note to the Academy of Sciences of Paris on the extirpation of the thyroid gland; he is not the only one who has made these experiments. Magueen, in 1846, had already performed the extirpation of this organ.

The operation in itself is not very difficult; but, notwithstanding, it is not always successful, as it is necessary for the purpose to dissect in the vicinity of several important nerves, which it would be dangerous to wound. Of four dogs I operated on two died, from twelve to thirteen hours after, in convulsions. When the operation is successful they continue to live without any sensible derangement in their health. Friedleben has extirpated the thymus ten times with success in young dogs. Consequent on this operation, he says, these young animals eat more than the others, and grow more

rapidly. These experiments tend to establish that there exists no relation between the functional activity of this organ and hibernation.

The blood of animals deprived of the thymus gland contains more white globules and less red than in the normal state. This fact is at variance with the theory of those physiologists who pretend that the spleen and other sanguine glands produce the white globules of the blood.

We meet with nothing but contradictions concerning these organs. After carefully examining the accumulated facts, it is still impossible to arrange them so as to build a theory satisfactory to the mind.

In 1857-58, a series of labours were undertaken on the functions of the supra-renal capsules. With a desire to throw light on this subject, Gratiolet, Brown-Séquard, and Vulpian, made experiments on these bodies. They extirpated the supra-renal capsules in divers animals, and they concluded, from their researches, that the extirpation of the capsule on the right side was constantly followed by death. Afterwards Dr. Philippeaux addressed a memoir to the Academy of Sciences in Paris, in which he relates many of the extirpation cases of the supra-renal capsules. He sums up his experiments—1st. That the extirpation of the supra-renal capsules does not necessarily cause death. 2nd. That when death ensues it is consequent on a dangerous operation, which occasions frequently either inflammation in the cellular tissue which environs it, or peritonitis, or even hepatitis, and not unfrequently internal hernia between the divided muscles. 3rd. That some animals survive the removal of the supra-renal capsules without the least inconvenience, either permanent or temporary, to their health and organic functions. 4th. That the supra-renal capsules do not appear to be more essential to animal life than the spleen or the thyroid glands.

But there is something better still than these experiments, and that is an observation by Dr. Martiny, of Naples, who has acquainted the Academy of Sciences with a case of complete absence of the supra-renal capsules in a man who died, at the age of forty, of tubercles in the lungs; but what was most extraordinary in this case, the kidneys were not in their proper place, but were united in one mass situated on the promontory of the sacrum. This specimen is preserved in the anatomical museum of the hospital at Naples. No one now considers the supra-renal capsules as having any function relative to the nervous system.

Addison, from certain facts in which the maladies of the capsules had determined a brown coloration of the skin, con-

sidered them as the organs which eliminated the cutaneous pigment which tends incessantly to form itself in the blood, and other toxic matters.

In the presence of the fact observed by Martiny, and the experiments of Philippeaux, this opinion must fall to the ground.

When we pass in mental review the numberless hypotheses which have been broached on the use of the organs in question, one is bewildered with the confusion they produce in the mind when not directed in its researches by the views of a sound theory.

What can be concluded from experiments practised on the living animal? One thing which is certain is, that the organs of derivation are not essential to life, and that they may be extirpated without any more danger than that which arises from the operation; however, the facts they furnish for observation are more favorable to the theory of derivation than any other. In fact, we do not find anywhere in these experiments the proof, nay, not even the indication which would lead us to suppose, that the organs in question fill the roll of elaboratory organs, either of the chyle or the lymph, and ought to be classed with the conglobulated glands.

In seeking for analogies between these bodies and the lymphatics physiologists have founded them on an unsound basis. The experiments of Tiedemann and Gmelin, and those more recent of Claude-Bernard, tend to demonstrate that the alimentary substances introduced into the organs of digestion are mostly absorbed by the radicles of the vena porta, and that the pretended chylifera only absorb a certain quantity of fatty matter. On the other hand, there is no difference to be observed between the chyle which has passed through the lymphatic glands and that which is found in the ramification of the vascular system.

There may be reason to suppose that the lymphatics only fill during the process of digestion, because the intestines are then in a state of congestion, both sanguine and lymphatic.

If these facts are verified, the lymphatics would only have a relative function to the mechanism of the circulation of the lymph; they would constitute reservoirs to the lymph analogous to those for the derivation for the blood.

The variations which we, conjointly with our predecessors, ascertained in the size of the spleen, at different periods of the digestion, are, no doubt, connected with the repletion of the vena porta consequent on the introduction of matter absorbed by the ramifications of the mesenteric veins in the intestinal cavity.

In works written on the organs of derivation are found a great number of contradictory opinions which it would have been impossible to enumerate. This was not the object I wished to attain, but, I repeat it, my object was to find the relation between the facts which have been registered by science. It is by the light the one reflects on the others that I have been guided in the intricate course in which I have been engaged. Perhaps my attempts might be considered rash, but I could not allow myself to be discouraged by the prospect of a failure, for it is only by repeated trials that the truth is to be discovered.

I terminate my labour by an observation which I consider to have great importance. In relying exclusively on the experiments performed on the living animals, one cannot hope to understand the functions of a system of organs which have but indirect relations with external agents.

Comparative anatomy furnishes, with the knowledge of the function of these organs, indications far more certain than the mutilations to which animals are submitted. It is to the anatomical disposition of these organs, and their relation in a series of beings, we have had recourse to establish the entirety of the theory of the derivation of the blood, which, entirety to our view, ought to take its place by the side of the circulation, and thus form the completion of it.

The theory of derivation may be summed up in the following propositions:

1st. All the organs of the animal economy consume, when in activity, a greater quantity of blood than when in a state of repose.

2nd. The arteries which convey the blood emanate from bifurcations of trunks larger than themselves, divert for their profit the blood from other arteries with which they are connected, and which originate from the same trunks.

3rd. All the viscera of the animal economy, being in a state of permanent repose during fœtal life, are provided with organs of derivation. To the brain are annexed the thyroid glands, to the lungs are annexed the thymus glands, and to the kidneys the supra-renal capsules.

4th. Immediately after birth the lungs and the kidneys enter upon their functions, and the derivatory organs, which were annexed to them, wither insensibly, to disappear even completely (the thymus) after a time.

5th. The brain and the stomach, being subject to intermittent laws of activity and repose, preserve their organs of derivation; for this reason, the thyroid gland and the spleen exist during the whole period of life.

6th. The hibernating and diving animals also conserve

the thymus during the whole of their existence, as their respiration becomes intermittent and suspended during hibernation.

7th. After parturition the blood is diverted from the uterus by the epigastric artery, which forms with the mammary arteries important anastomoses.

8th. The derivation of the blood is explained by very simple physical laws. When a tube is divided into two branches, the one in which the current is the most active will naturally receive a considerable larger quantity of liquid than the other, and *vice versâ*.

9th. Organs submitted to the laws of intermittence of activity and rest, had they not been provided with organs of derivation, they would have received in all cases the same amount of blood. This continued flow of blood would have occasioned congestions, and would have ended by an alteration of structure and organization.

10th. The derivation of the blood appears to us necessary for the regular distribution of the nutritive and secretory matter, and as a completing function to the circulation.

Verbal communication on the Extirpation of the Spleen, made to the Academy immediately after the lecture of M. Fossiou, *by* Prof. Thierness, *Titulary Member.*

Gentlemen,—Permit me, on the occasion of the memoir of our learned colleague M. Fossiou, to make a communication which has an important relation to it. Since 1843 I have undertaken, with my learned colleague M. Gluge, experiments in reference to the elucidation of the function of the spleen. We have with this view extirpated this organ in a great number of dogs, and also in some goats. Now, these experiments, which we have not yet been able to publish in a concise form, agree to a certain extent with the observations of M. Fossiou, and tend to demonstrate that the spleen is an organ which diverts the blood from the stomach, which, when in activity, cannot with impunity receive a large quantity.

You know, gentlemen, as M. Fossiou has just recorded, that the digestion is intermittent in the carnivorous animals, and that this function is, on the contrary, almost continuous in many herbivora and more particularly in the ruminants. Hence, the spleen, as an organ of the derivation of the blood directed to the stomach, is most useful and even necessary to the carnivora, but useless to the ruminants. In fact, of the number of dogs we have deprived of the spleen only one has survived, viz. a greyhound, which, after suffering for a long time, completely recovered, though it was an old dog,

and seemed to be in perfect health during the few months he was kept for the purpose of observation, before being destroyed. All the others perished in a more or less short time after the operation. As to the goats on which we have experimented, they suffered little or nothing. One has been kept in perfect health for more than twelve months. Up to this point our experience is confirmative of the conclusions arrived at by M. Fossiou concerning the spleen; it tends to demonstrate that this viscus is really charged with the physiological roll which is attributed to it by our honoured colleague, but this experience does not allow us any longer to agree with him when he expresses an opinion that the spleen does not produce any modification of the blood which passes through it. This, in fact, we have verified in the autopsy of the dog and the goats in question. We have found in the lymphatic ganglia, particularly in those of the mesentery, important modifications. These organs were evidently much enlarged, and on a microscopic inspection, made principally by one of us (M. Gluge), we found in them pigmentary granulations similar to the splenic pulp, most of them enclosed in cells, and depending probably also on the disintegration or transformation of the red corpuscles of the blood. This is an important fact, which had already been verified in Germany.

Moreover, I have actually still at the Veterinary School a bock from which the spleen was removed in the month of July, 1865. This animal, the health of which is perfect, may serve for a future verification of the fact.

Meanwhile we admit with M. Fossiou that the spleen is in reality a diverticulum to the stomach, that is to say, an organ of derivation of the blood to the stomach, to which it is annexed, and that in this quality it is very useful to certain animals, viz. the carnivora, less so to the herbivora, and more particularly the ruminants. But we do not admit with him that this organ is without influence on the blood, which it receives in large quantities. We think, on the contrary, with most of the physiologists, that, as demonstrated by our experiments, it produces in this organic fluid modifications the nature of which we are not yet able to determine, and that the lymphatic ganglia, (allied) glands, perform the function when the spleen has been removed, as well as in cases of alteration of which the spleen may be sometimes the seat which impede or suppress its function.

Veterinary Jurisprudence.

DISINTERMENT OF THE CARCASES OF CATTLE PLAGUE ANIMALS IN SUFFOLK.

At the Needham Market Petty Sessions, held during the first week of September, George Driver, formerly of Blakenham, farmer, and Robert Cutting, of Ipswich, marine store dealer, were charged with having dug up, or caused to be dug up, portions of animals that had been buried under the Cattle Plague Act. The remains were those of two bulls which had been shot by order of the cattle plague inspector, and buried in a meadow which now belonged to Driver. Driver gave Cutting leave to dig up the bodies, and there seemed to be no concealment about the affair. The Bench fined Driver £5.

George Fuller and Joseph Cutting (defendant Cutting's son and son-in-law) then pleaded guilty to the same offence. Defendants both admitted that they were paid 2*s.* 6*d.* each for doing the work. They all said they did it in ignorance of the consequences.

The Bench decided upon fining the defendant Cutting in the last case 30*s.*, including costs, and the two present defendants 15*s.* each, including costs. Defendants were locked up in default, but were subsequently liberated on promising to pay the money the same evening.

ARMY APPOINTMENTS.

War Office, Veterinary Department; *Sept.* 1*st.*

Veterinary Surgeon James Lambert, 17th Lancers, to be First Class Veterinary Surgeon, *vice* Rollings, Royal Artillery, deceased; George Aitken, Gent., to be Acting Veterinary Surgeon; William Dunk Rogerson, Gent., to be Acting Veterinary Surgeon.

Sept. 15*th.*

Veterinary Surgeon James Woodyer Callow, General Staff, Aldershott, to be Veterinary Surgeon of the First Class, *vice* James G. Philips, Royal Artillery, who retires upon half-pay; Stephen Knott, Gent., to be Acting Veterinary Surgeon.

Veterinary Surgeon John Pile has been permitted to resign his commission.

Her Majesty has been graciously pleased to command that First-Class Veterinary Surgeon W. Lamb, Bombay Army, be promoted to the rank of Staff Veterinary Surgeon, from August 15th, 1868, in consideration of his valuable services with the Abyssinian Expeditionary Force.

MISCELLANEA.

VETERINARY INSPECTION OF FOREIGN SHEEP.

The Board of Customs have issued directions that sheep which are detained for slaughter at the wharves at any port under the provisions of the Order in Council of the 20th August last, be submitted to a daily inspection by the veterinary surgeons. This order has been deemed necessary in consequence of the report from the Veterinary Department of the Privy Council, to the effect that where a number of animals are collected together cases of smallpox appear day by day, and that unless there is constant supervision the meat of diseased animals will certainly be sent to market.—*Daily News*, Thursday, Sept. 10th.

HOW THEY DEAL WITH CATTLE PLAGUE IN POLAND.

If the following statement from the *Times* of Sept. 10th is to be accepted as an illustration of what is usual in Russian Poland, it furnishes a striking comment upon the suggestion which has been made to arrest the progress of cattle plague in those countries where it is indigenous:—"Towards the end of June the cattle plague, never entirely extinct in those tainted regions, visibly increased in all Lithuania, especially in the district of Kowno. After unconcernedly looking on at the destruction for several weeks, the authorities at length distributed among the country people a paper teaching them how to guard against the disease, and how to deal with the infected and dead animals. But the useful information being, unfortunately, conveyed in Russian to the benighted peasantry, remained a book with seven seals. The pestilence grew, the cattle were dying off fast in every village, yet the Russian police would not abate a jot of their dignity by circulating translations of their 'book.' In many cases the poor farmers were reduced to such straits that village elders were not ashamed of calling in the assistance of children, and applying to the rising generation, which has been furnished with Russian spelling-books, for an explanation of the mysterious yet valuable paper. But, of course, the handling of a Russian primer had not enabled the boys to interpret the contents of a veterinary treatise; so the cattle kept on dying, and continue to do so to this day."

ERRATUM.

In No 489, Sept., 1868, page 614, line 7, *for* "staphylema," *read* "staphyloma."

which are found in London dairies; and such cows at Frocester, depastured in the summer, yielded from 650 to 700 gallons of milk apiece per annum. They were, however, milked ten months, whereas the London cow is got rid of after eight months' milking in the case I have supposed. But the quantity of 11 and 12 quarts a day, which is the extreme report of some of the smaller cowkeepers, does not seem, on a comparison with Frocester, so incredible. On the other hand, if you consult the larger cowkeepers, supplying dealers who come and milk the cows, paying for what they take away, they will tell you that the average yield does not exceed 9 or $9\frac{1}{2}$ quarts a day to every stall. It is plain that where cows are kept on till their daily yield is 5 quarts or less, in order to get fattened before sale, the average must be less than where the cow is got rid of sooner, and a greater loss submitted to upon her sale. On Lord Granville's farm at Golder's Green, Mr. Panter, his lordship's agent, has told me that £3900 was received one year for the milk of 100 stalls; in another year the sum received was £4300 from 108 stalls constantly occupied; and in a third £4900 was received from 120 stalls. This at 1*s.* 10*d.* per 8 quarts, which was the price received, amounts to 851, 868, and 891 imperial gallons per stall per annum, or $9\frac{1}{3}$, $9\frac{1}{2}$, and $9\frac{3}{4}$ quarts respectively per cow per diem. This is where about 150 cows were purchased and sold every year at a loss varying from £3 to £4 a head to keep 100 stalls constantly full. The cows were thus kept on an average eight months each, and two thirds only of the above quantities, 568, 587, and 594 gallons are all that was taken from each cow during the eight months it was kept.

I was informed that 89,236 imperial gallons were obtained in one year upon Colonel Talbot's farm at Sudbury from eighty stalls. The cows were sold earlier than at Golder's Green, not being kept longer on the average than six months (153 having been sold and bought to keep eighty stalls full). In this case no less than 1115 gallons was obtained per stall per annum, or fully 12 quarts per stall per diem. The cow here yielded 560 gallons in little more than six months, which is an enormous quantity for the average of so large a number as eighty.

I have yet two other cases by which to illustrate this point—the small dairy in Islington and the farm at Barking, to both of which I have already referred. In the former there are (January, 1868) seventeen cows in milk, and they are giving over 140 quarts a day, or about $8\frac{1}{4}$ quarts a piece; but many of them are old cows, and some, an unusual thing,

are in calf, and nearly dry. The owner tells me that the quantity calculated on in a shed of twenty Irish cows is an average of 10 quarts a day a piece. He seldom keeps a cow after she gets down to 6 quarts; and, as he considers it does not pay to fatten cows in London, he sells at an average loss of £4 or £5 a head. Buying them at from £12 to £18 a piece, or at an average of £15, he has generally sold them at an average of £11. He has given me the following account of six cows during the past year, which, however, represents more than his ordinary experience.

No.	When calved or bought.	Cost apiece.	Daily produce in quarts.		
			Till June.	June till September.	September till December.
	1867.	£			
1	February 5	18	16	14	12
2	„ 7		13	11	8
3	July 12	15	...	12	11
4	„		...	12	10
5	August 3	15	...	14	13
6	„		...	12	10

Of a small, shabby-looking little cow I saw there the other day the following history was given me:—She was in heavy milk when attacked by the cattle plague in the summer of 1866, which of course entirely stopped her milk. She recovered, however, and her average produce amounted to 20 quarts a day for nearly three months after her recovery. It averaged 17 quarts a day during the next six months, and 12 quarts a day for another six months; and it is now shrinking rapidly, as she is in calf; but she is still giving 7 quarts a day. We occasionally meet with extraordinary examples of this kind, where cows remain for years together in milk without breeding; but, like all other agricultural maxima, they have little or no influence on the general average of experience.

I have now to relate the experience of a year at Lodge Farm, Barking, notwithstanding that, owing to the disaster in August, when more than half the cattle were slaughtered by orders of the Cattle Plague Inspector, the returns do not so accurately represent ordinary experience as would otherwise have been the case. I give, in the following table, the number of cows milked each week up to the end of 1867, the quantity of milk sold each week, and the daily average per cow during each week. It will be seen that 126 cattle were killed in the middle of August. We have not ventured to

purchase again till lately. Twenty newly calved cows were bought two months ago, and are now averaging rather more than 3 gallons a day apiece. But there are a large number of cows giving hardly more than 6 or 7 quarts a day upon an average, which have been long at the pail, and which there is no profit in fattening. Most of them, accordingly, have been got in calf, and are drying rapidly. This, of course, is much against the average of the year. On the other hand, a large number of cows were killed off in full milk. So that while there are a hundred cows or more which have been ten or eleven months at the pail, and which pull down the annual average, there are more than a hundred on the list of the year which were only two or three months in milk when slaughtered; and they, on the other hand, contributing more than the ordinary daily quantity, increase the average. It will be found, on an examination of the following table, that about 139,746½ gallons have been given in sixty-five weeks by 57,334 days' milk of a cow. This is equal to rather more than 9⅔ quarts a day per cow, which very closely resembles Mr. Panter's experience at Golder's Green. See next page.

The true significance of these figures will, perhaps, better appear if the amounts which they indicate for twelve months be taken out. In the table at p. 717, accordingly, I have given the quantity of milk produced in twelve months, dividing it by the number of days of a cow milked during those twelve months, and so representing the average daily produce of the cow during the whole year.

I fear that these figures (let alone the fact which we may infer from them, that disastrous losses, if not from cattle plague, from pleuro-pneumonia and from foot-and-mouth disease, are possible) are not particularly encouraging. We have been receiving 1*s.* 5*d.* to 1*s.* 8*d.* the barn gallon—*i. e.*, from 2⅛*d.* to 2½*d.* per quart—for this milk upon the farm.

Week ending.	Number of cows at end of week.	Number of days milking of a cow during week.	Total produce of milk during week.	Gallons per cow daily during week.	Week ending 1867.	Number of cows at end of week.	Number of days milking of a cow during week.	Total produce of milk during week.	Gallons per cow daily during week.
1866.	Cows.	Days.	Gallons.	Gallons.		Cows.	Days.	Gallons.	Gallons.
Oct. 5	8	56	161	2·88	May 24	247	1,720	4,589	2·66
,, 12	8	56	188	3·36	,, 31	252	1,764	4,830	2·72
,, 19	14	93	310	3·32	June 7	252	1,764	4,827	2·72
,, 26	23	148	435	3·06	,, 14	253	1,765	4,750	2·68
Nov. 2	23	161	545½	3·38	,, 21	255	1,775	4,688	2·63
,, 9	23	161	549	3·4	,, 28	255	1,785	4,501	2 54
,, 16	23	161	540	3·34	July 5	255	1,785	4,262	2·39
,, 23	28	191	596	3·12	,, 12	255	1,785	4,054	2·21
,, 30	35	231	695	3·0	,, 19	247	1,729	3,910	2·26
Dec. 7	35	245	777	3·08	,, 26	247	1,729	3,832	2·27
,, 14	44	276	824	3·0	Aug. 2	237	1,659	3,739	2·25
,, 21	46	312	958	3·06	,, 9	237	1,659	3,658	2·20
,, 28	53	346	1,095	3·14	,, 16	116	1,239	2,488	1·76
1867.					,, 23	111	777	1,458	1·89
Jan. 4	57	384	1,170	3·04	,, 30	111	777	1,431	1·85
,, 11	61	411	1,234	3·0	Sept. 6	111	777	1,405	1·82
,, 18	70	458	1,365	3·0	,, 13	111	777	1,403	1·82
,, 25	72	496	1,475	2·7	,, 20	111	777	1,418	1·82
Feb. 1	77	524	1,575	3·0	,, 27	111	777	1.443	1.88
,, 8	87	594	1,736	2·92	Oct. 4	111	777	1,414	1·82
,, 15	87	609	1,831	3·0	,, 11	111	777	1,339	1·73
,, 22	94	651	1,929	2·96	,, 18	111	777	1,359	1·74
Mar. 1	95	695	1,961	2·8	,, 25	100	739	1,338	1·82
,, 8	132	793	2,167	2·6	Nov. 1	100	700	1,266	1·8
,, 15	169	1,040	3,067	2·94	,, 8	92	644	1,190	1·82
,, 22	186	1,238	3,631	2·92	,, 15	92	644	1,121	1·74
,, 29	192	1,357	3,970	2·92	,, 22	92	644	1,060	1·64
April 5	204	1,420	3,876	2·72	,, 29	92	644	983	1·52
,, 12	207	1,434	3,698	2·40	Dec. 6	90	630	987	1·56
,, 19	202	1,437	3,675	2·56	,, 13	79	578	1,087	2·09
,, 26	203	1,421	3,702	2·6	,, 20	78	546	1,099	2·19
May 3	203	1,421	3,615	2·54	,, 27	73	511	1,076	2·1
,, 10	224	1,515	4,040	2·60					
,, 17	224	1,568	4,351	2·77	Total ...		57,334	139,746½	2·44

We have been paying more than 1*s.* a week per cow for cowmen; the grains and meal and hay consumed, with grass at 18*s.* a ton cut and delivered at the cowhouse, have cost 9*s.* to 12*s.* weekly; the loss on sales has been at least 2*s.* a week per cow; and taking rent of sheds into account, the cow has cost more than from 13*s.* to 15*s.* a week. It is plain that, wherever the average yield throughout the year falls below ten quarts a day there must be a loss, if the cowkeeper does not receive a higher price than I have named.

Year ending.	Quantity of milk produced.	Number of days of one cow.	Daily milk per cow.
	Imperial gallons.		Imperial gallons.
Sept. 27, 1867 . .	124,427½	48,723	2·55
Oct. 25, „ . .	128,783½	51,440	2·5
Nov. 29, „ . .	131,478	53,811	2·44+
Dec. 27, „ . .	132,073	54,897	2·41−
67 weeks . . .	139,746½	57,334	2·44−

The dairy farmer who disposes of his milk at the nearest station at 2*d.* a quart, makes, perhaps, more of it than he could by cheese or butter, and he saves a good deal of the labour for which, as a cheese or butter farmer, he has hitherto had to pay. But it is right to warn any one who thinks to begin dairying near town in any locality where the industry is new, that his labour-bill will be a very great difficulty in his way. I need not, however, illustrate this at any greater length. Enough has been said to show that the profits of the honest wholesale cowkeeper are earned with difficulty.

The commercial aspect of this subject, as distinguished from the agricultural, must be treated very shortly in this Journal. I have little to add to the information collected two years ago for the Society of Arts. From returns then made by asylums, schools, and institutions (not infirmaries, or hospitals, or workhouses, where special dietaries exist), it appeared that two fifths of a pint of milk a day is the average quantity which a mixed population of healthy people consumes when its diet is under medical direction. And in some places the actual consumption approaches this quantity. Thus the town of Stirling, which has a population of 12,500 persons, was then supplied by 190 cows in the town, besides 200 gallons a day of buttermilk (a most nutritive and useful food) brought in by rail and otherwise. There was here a cow to every sixty people; and this, at the average of 800 gallons yearly to every cow in milk gave 100 imperial pints per annum to every man, woman, and child, or about two sevenths of a pint a day apiece, very nearly the medical standard; and, indeed, exceeding it, when the 200 gallons a day of buttermilk are taken into account, for this would furnish half a pint a day to the 3200 belonging to the labouring class in a community of 12,000.

The English town of Mansfield may be fairly compared with the Scottish town of Stirling. It contains about 10,000 people and 108 cows. Taking these at 800 gallons a head

per annum, and adding 20 gallons of skim milk daily, of which I heard as being sold in the outskirts of the town, there were only 9 gallons (72 pints) per annum for each inhabitant, or one fifth of a pint a day apiece—one half the medical standard.

Take, now, Bedford. It contained, in 1865, at the time of my inquiry, about 15,000 people and 100 cows; and 123 gallons of milk, the daily produce of about fifty other cows, were brought in daily by railway; 150 cows to 15,000 people are one cow to 100 people, about the same as at Mansfield; and this, at 800 gallons a cow, is about 70 pints a year, or one fifth of a pint a year apiece—one half the medical standard.

If, then, one fifth of a pint a day be taken as the quantity, not which ought to be, but which *is* consumed in general by a mixed population of English people, then the 3,000,000 of our London population require 300,000 quarts a day; and this, at 10 quarts a day from each cow, or rather from each stall, indicates 30,000 stalls occupied by cows kept upon the London plan, as needed for the London milk supply. And if people were fed according to the medical rule of our selected institutions, twice this number of stalls, representing about three times that number of cows per annum, would be needed for the supply. At the time of my inquiry into this subject, two years ago, I ascertained that the usual number of cows kept within the metropolitan district was about 24,000; and between 30,000 and 40,000 quarts of milk a day, in addition to the town production, were then being brought in from the country, which must have needed 3000 or 4000 cows for its production; so that the total number of cows then engaged in supplying London fell considerably short of the number indicated by the average of such towns as Bedford and Mansfield.

During the cattle plague more than half of the 24,000 London cows disappeared, and the railway delivery of milk rapidly increased; and though, as the London cowhouses have again filled, the country trade has somewhat declined, yet the quantity still delivered is very great indeed.

The following table, of which the figures have been most obligingly supplied to me by most of the leading metropolitan railways, indicates the growth and, in some measure, since the spring of 1866, the decline of the trade.

Monthly Delivery of Milk (Imperial Gallons) by Metropolitan Railways.

	Great Western.	North Western.	Great Northern.	Midland.	Great Eastern.	South Western.	London and Brighton.
Jan. 1865	8,954	14,168	14,904		76,818		13,547
Feb. ,,	9,460	13,024	15,276		76,846		13,872
Mar. ,,	14,590	12,752	16,416		74,783		14,891
April ,,	11,775	10,242	18,216		84,452		17,424
May ,,	13,050	6,624	20,124		69,891		17,258
June ,,	14,932	6,656	20,392		68,212		21,992
July ,,	12,791	8,480	20,556		82,525		19,239
Aug. ,,	23,474	23,152	20,952		70,005		17,322
Sept. ,,	59,782	76,160	21,924		101,212		22,251
Oct. ,,	103,214	123,952	26,016		112,890	116,560	23,483
Nov. ,,	116,802	116,700	27,576	3,760	88,714	112,800	19,394
Dec. ,,	140,293	148,296	27,180	10,120	109,325	116,750	21,816
Jan. 1866	143,600	155,952	30,348	23,620	95,269	97,812	21,604
Feb. ,,	186,764	143,880	31,608	20,740	106,483	107,772	22,884
Mar. ,,	201,686	158,484	33,516	21,980	116,700	116,352	26,663
April ,,	211,016	142,188	35,516	18,100	145,647	161,448	30,725
May ,,	285,918	125,208	39,492	15,000	120,993	133,476	35,508
June ,,	221,851	95,352	37,512		120,178	135,516	42,696
July ,,	166,892	80,304	39,012		109,973	164,268	34,171
Aug. ,,	153,766	64,572	38,292		109,431	112,716	30,813
Sept. ,,	110,159	53,772	35,280		109,362	137,976	29,710
Oct. ,,	115,834	63,072	36,444		107,955	114,024	34,399
Nov. ,,	120,346	59,936	35,316		107,542	111,276	28,717
Dec. ,,	126,819	66,564	33,336		109,295	119,388	28,792
Jan. 1867	118,870	63,480	31,068	12,528	110,048	118,824	32,649
Feb. ,,	131,210	54,648	29,784	16,368	102,500	112,152	27,478
Mar. ,,	156,579	61,908	37,128	16,284	106,228	124,584	30,086
April ,,	122,979	60,696	36,180	16,152	106,510	120,348	24,680
May ,,	160,628	54,156	38,316	12,816	106,968	126,720	30,691
June ,,	125,499	49,800	40,212	10,572	109,107	129,600	30,027
July ,,	112,233	49,752	43,392	11,676	105,542	132,012	39,457
Aug. ,,	118,720	39,084	42,744	14,244	105,487	126,576	42,240
Sept. ,,	95,965	38,088	39,788	16,764	109,605	118,224	38,051
Oct. ,,	86,668	50,640	40,728	13,068	107,561	124,140	59,526
Nov. ,,	149,510	50,652	38,772	19,908	128,084	121,176	32,630
Dec. ,,	123,121	60,528	37,884	19,920	126,784	125,916	31,739

It is this aspect of the subject which more than any other is directly interesting to the readers of this journal. So large an increase in the quantity of milk brought up to town as took place during the cattle plague indicated, of course, a very considerable alteration in the management and industry of many a dairy district. And as the facilities offered by the London railways increase, and the methods of transmitting milk with safety are improved, so no doubt we may expect an extension of the trade between the London milk dealer

and the country dairy farmer. The latter cannot generally make more than 7*d.* a gallon by cheese or butter and pork or bacon; and if the London milk dealer will give that or a little more at a distant railway station, it may be for the interest of the farmer to give up the expense and labour of dairy management, and in their place incur the risks and costs of a new and unaccustomed trade. The exchange has not always been satisfactory; for until, by cooling the milk before starting, and by perfectly filling the cans and carrying them without excessive shaking, the liabilities to souring and spoiling on the road have been diminished or avoided, great losses, especially in hot weather, have been and will be suffered.

I say nothing here of other risks which interfere with the extension of this trade—the risk of bad debts which the farmer runs, and the risk of adulterated milk which the dealer runs—for these are common to all commercial dealings. A London wholesale cowkeeper will receive from his customer who comes to his cowhouse and milks his cows 3*d.* or 4*d.* an imperial gallon more than the farmer will receive for country milk delivered, with all its charges paid, at the London terminus; not only because it is the produce of specially fed cows and perfectly fresh, but because it is certain to be unadulterated. I was told the other day by a London milkman that every barn gallon of such milk as his would "*bear*" a quart of water without any chance of the adulteration being detected by an ordinary consumer; and he had known that quart put in before the milk had left the country farm on its railway journey. The mere risk of such dishonesty is enough to lower the market value of the article to dealers, who probably would rather benefit by some such dilution than suffer from it.

I add from the information laid by Mr. Brooks, of the London and North-Western Railway, before the Milk Committee of the Society of Arts, the following particulars, which, being indicative of the management of the traffic on that one railway, are instructive on the subject of the railway milk traffic generally.

The milk is brought to Euston Square from all railway stations between London and Northampton, being conveyed (in cans provided by the senders) on open carriage trucks. The charge for a distance not exceeding 100 miles is 1½*d.* per imperial gallon, and when the distance exceeds 100 miles 2*d.* per gallon. When the great increase in the traffic commenced, milk was sent up from places 180 and 200 miles distant—from Huddersfield, Macclesfield, &c. The greatest

distance from which milk is sent now is about 95 miles. The carriages which are used for the conveyance of the milk are as well constructed as they can be in respect of the springs, as it is desirable that the milk be as little shaken on the journey as possible. The French milkcans are about half the size of those used here. Our cans are much too large and too heavy to be loaded and handled by one man. Their shape, too, hinders close packing; they are broad at the bottom and tapering towards the top. The French cans, from their cylindrical shape, can be packed with greater economy of space. The French milk trucks are very much like the narrow guage sheep-truck used in this country, with two floors, one above the other—two tiers, in which a great number of cans can be packed, and there is a circulation of air all round them. On the other hand, the French cans are heavier per gallon of their contents than the English; and it is not likely that the former will be adopted.

It is a stipulation with the dealers that their men shall assist the railway porters in unloading the trucks, because the cans are too heavy to be handled by one person. The weight of a can filled with milk is nearly 200 lbs. The trade has come to be of such an extent as to lead to the despatch of special trains for the purpose; and the milk is brought to the various stations in time for them. One train arrives in London at a quarter to twelve in the forenoon, for the afternoon supply; and the second train arrives about half-past eight in the evening, for the next morning's supply. During the time of the greatest scarcity of milk an arrangement was made for bringing cream from a distance so remote as Carlisle; and that was done by the article being placed in small cans—much smaller than the French milkcan—and carried suspended in the truck; but when it arrived in London it was found that the cream was reduced almost to the consistency of milk. The trade was, therefore, abandoned.

Mr. Brooks, in reply to the questions of the committee, stated that no other means are now taken by the railway company to develop the milk trade than the putting on of more trucks, and eventually establishing special trains for it. He says that those who make complaint about the rates of carriage cannot have calculated the price per ton at which the company carry the milk, or they would have found that the milk, including the weight of the cans, is carried a distance of 100 miles for 1*s.* per cwt. When the milk train arrives the dealers assist in the unloading of the vans, and the milk is carried away in the dealers' own conveyances. He was not aware of any other means by which the milk

could be more promptly or more rapidly distributed than it is under the present system.

THE ABYSSINIAN PROMOTIONS.

Sir,—You have done good service in drawing public attention to the unaccountable omissions in the matter of rewards and honours for the campaign in Abyssinia.

Surely it is not yet too late to do justice to those who, though as fully deserving and as highly recommended as the gentlemen already so liberally recompensed, are conspicuously absent from the list recently published.

It is impossible to divine by what process of selection those honours have been bestowed in some instances, while in others they have been withheld. It is certainly not a process of natural selection.

Perhaps the most striking and puzzling example is that to which you incidentally refer, furnished as it is by the medical and veterinary-medical departments of the expedition. The per-centage of sickness among the troops engaged was, I believe, less than among our troops at home; and though measures were wisely taken to meet emergencies, yet they were scarcely, if at all, tested. The surgeons had, therefore, comparatively speaking, little to do, and that little they must have done remarkably well, for a large batch of their number has been compensated by liberal rewards. The veterinary-medical officers and the veterinary department meet with no acknowledgment whatever, though the history of the brief campaign will amply testify that their energies and skill were most severely tested, and that the success of the expedition depended in some measure upon their efforts. And what higher testimony could we have to this, and to the expectation that at least some justice might be done to these officers, than is to be found in the words of Lord Napier himself. Nothing could be more satisfactory and encouraging than his praise of their conduct in the field, but nothing could be more unsatisfactory and disheartening than the mysterious absence of their names from the lists of the rewarded. Surely this should not be; and have we not some claim to ask that justice be done. I am, &c.

G. F.

'*Standard*,' *August 26th.*

THE CATTLE PLAGUE IN NORFOLK.

THE following is the paper read by Mr. W. Smith, M.R.C.V.S., at the meeting of the British Association last week:

Cattle plague, steppe murrain, or rinderpest is a highly contagious and infectious fever of the eruptive or exanthematous kind affecting the ox tribe, to which it is indigenous in the steppes of Western Russia, and does not break out in other parts of Europe, unless introduced from its home on these plains by the specific virus from infected animals; no amount of filth, overcrowding, or other depressing influences has hitherto produced it in any other part of the world.

It is a bovine disorder, but sheep, goats, deer, and others of the order Ruminantia, will take it from the ox by inoculation or association. It does not maintain that virulent and destructive character in the systems of these animals that it does in those of oxen; it kills from 70 to 80 per cent. of the ox tribe when it gets into a herd in Eastern Europe, but is not so fatal on its native plains. It has an incubative period of from four to nine days, and in some instances even more. Any of the fluids of an infected beast will reproduce it in another by inoculation. It seldom or never attacks the same animal twice.

SYMPTOMS AND DURATION.

These observed in Norfolk were various, *some of the most prominent were occasionally absent*, but amongst the earliest were elevation of temperature which, as indicated by the thermometer, rose from 102° F.—the mark in health—when introduced into the rectum or vagina, to 104° and 106°. In a few days the mucous membrane of the mouth was generally reddened and the pulse increased, sometimes an eruption was to be seen on the nose, udder, belly, and thighs, dulness, loss of appetite, constipation, &c., at a more advanced stage diarrhœa set in with bloody discharges. The beast frequently but not invariably hung its head and lopped its ears, had a slimy and copious discharge from eyes and nostrils which adhered to the face, stinking breath, increased respiration, accompanied with moaning, then followed great prostration, lowering of temperature, twitchings of muscles, a deposit of cheesy-like matter on gums and in under lip, with marginal excoriated lines round the necks of the teeth, emphysema of body, &c. Death occurred from five to seven days after the beast was observed decidedly ill, and which

was attended by an increase of some or more of these symptoms.

Post-mortem Appearances.

The rumen was generally found full of food, as were the second and third stomachs (these often showing little signs of disease, the fourth stomach always did), the mucous membrane being spotted with red and showed marks of extravasated blood, as also did the mucous coat of the intestines. The heart, urinary organs, lining membranes of trachea, bronchial tubes, and most of the other organs of the body were marked with petechial spots.

Treatment.

This, by means of drugs, in Norfolk, was of the most persistent, varied, and unsuccessful character. The county is remarkable, however, for having, in conjunction with the London Homœopathic Society, instituted the first and last costly and extended series of experiments in homœopathy that were ever made in this disease; the result was a *complete and total failure.* A prize of the value of £100 was offered by the Lord Lieutenant of Norfolk to the person who should be the most successful in treating the disease, without having a single applicant, so little amenable to medicine was the disease in this county.

Vaccination also signally failed. Several cows in this city were vaccinated, the vesicles formed went through their usual course, and were considered perfect, but so little was its protective power, that every one of them, having previously been exposed to the contagion of rinderpest, became ill and were killed, having the disease in a severe form.

History—The Cattle Plague, &c.

The cattle plague has been known for more than a thousand years to have periodically devastated the continent of Europe. About 810 it is supposed to have visited England; we have no authentic record of its having broken out in this island again until 1714, when, strange to say, it appeared in Islington. About the middle of July it committed great ravages for about three months, and disappeared towards Christmas in the same year. It re-appeared in April, 1745, being, it is supposed, imported into England by some calves from Holland; it lasted twelve years, and killed many thousand head of cattle; it soon, as in the outbreak of 1865, found its way into Norfolk, establishing centres of contagion in the same districts that have so recently suffered from it. In

March, 1770, it was imported into Portsoy, in the Moray Firth, but was stamped out with a comparatively trifling loss, the spread of the disease being prevented by the judicious and timely slaughter of the affected beasts, and those which had been in contact with them, and in Aberdeen in 1865 it was twice stamped out by the adoption of similar means.

The outbreak in England of 1865 occurred in the middle of June, and was first observed at Islington, as in a former instance, and like it soon found its way into Norfolk. It was brought by a lot of foreign oxen from the Metropolitan into Norwich Market on Saturday, July 1st, by cattle dealers, some of which were sent to North Walsham and Trunch, and the remainder to Whitwell, parishes lying fifteen and twelve miles north and north-west of Norwich. From these two centres of contagion the pest rapidly spread, and within about a month the loss in the North Walsham district alone was estimated at the time to amount to £1059. On the 4th August—I must be excused for saying that having been consulted in connection with Mr. Shipley, V.S., of North Walsham, at Mr. Bidewell's, of Trunch, with regard to the disease of his oxen, that I had such strong suspicion of its nature that I felt it my duty to address a letter to the Privy Council Office on the same evening, drawing its attention to the facts that no efforts were being made to arrest it, free intercourse between diseased and healthy beasts was permitted, and the carcases of those which died of the malady were in many instances so carelessly disposed of, being scarcely covered with earth, and sometimes only with a little litter, that unless some restrictive measures were speedily adopted, a large proportion of the beasts in this neighbourhood would be destroyed. To this letter a reply was received by return, dated 5th August, stating that the Lord President of the Council had directed it to be placed in the hands of Professor Simonds, and that an inspector should be sent to Norwich with a view to ascertain whether any and what steps could be taken to arrest the progress and prevent the spread of this very serious disease.

In the Reepham district the pest was scarcely less active, although it was stated that 50 per cent. of the early cases recovered. This was an exception to the rule, for between 70 and 80 per cent., and even more, succumbed to its virulence in the other infected places, not only in Norfolk, but, I believe, throughout the kingdom.

Through the instrumentality of Mr. C. S. Read, M.P. for Norfolk, a meeting of the agriculturists of the county was

held on the 5th of August, a committee formed, and a deputation appointed to the Board of Trade to get the Orders of Council, of the 24th of June, extended to the infected rural districts, who urged upon the Government that a great means of checking the disease would be to prevent the diseased cattle from being sent from the metropolitan market into the country districts. The deputation was informed that the authorities could not interfere in such a way with the trade of the country. Thus the result of the deputation was practically valueless, and it was suggested by Mr. Read, and adopted by the meeting, that the agriculturists of the county should help themselves, and that a Mutual Assurance Company should be at once formed, that they should combine and agree not to purchase any stock for at least six weeks, and that a subscription should be raised for the purpose of relieving those who had already, or might become sufferers. This agreement to abstain from purchasing fresh stock, did *important service* to the county, and was a great means of checking for a time the progress of the disease; many, however, who did not enter into the agreement, bought stock and suffered severely for their folly, but, unfortunately, not singly, for they were the means of carrying the disease to their neighbours, and of establishing fresh centres of contagion, and many outbreaks were traced to these proceedings.

On the 12th August, one of the largest and most influential meetings of noblemen and agriculturists of Norfolk that ever was held in the county assembled, when a subscription was entered into, headed by Lord Leicester with the munificent donation of £500, and the Norfolk Cattle Plague Association formed, which did such great and memorable service to the county. And not alone by its compensation fund was this effected, but its complete organization, its moral influence, its activity in watching the progress of the pest, and sending out its agents and inspectors to control, as far as possible, its destructive power, its directions for isolating affected animals, disinfecting premises, and advice for the adoption of such preventive measures as it had at its command, were the additional means it employed to ensure the great success that followed the operations of the association, which is best told by its results, and which will shortly be detailed.

(*To be continued.*)

Translations and Reviews of Continental Veterinary Journals.

By W. Ernes, M.R.C.V.S., London.

AN ESSAY ON THE SUPPLY OF BLOOD TO, AND THE FUNCTIONS OF, THE SPLEEN, THYROID GLAND, AND SUPRA-RENAL CAPSULES.

Presented to the Royal Academy of Medicine of Belgium by Dr. Fossion, Honorary Member of the Academy, &c.

(*Continued from* p. 460.)

Experiments made on living animals.—We shall now examine the importance to be attached to the numerous experiments which have been made at different times on living animals, and what are the consequences derived from those which have been made by ourselves with a view of discovering the function of the spleen. We have extirpated the spleen in eight dogs. This operation is in itself not very difficult to perform. An incision is made at the left hypochondrium to the extent of the breadth of three fingers; the finger being introduced in the incision, the organ is brought into view; the amputation is then easily performed, and the lips of the wound are united by two points of suture. It is not necessary to tie any of the blood-vessels.

Of the eight dogs I have deprived of the spleen three died on the fourth, sixth, and seventh days. The five others perfectly recovered. In the three cases death was the result of peritonitis.

In the dogs which had recovered no alteration was perceived in their general health; they were killed from two to three months after. At the autopsy nothing abnormal was found, either in the abdominal viscera or the mesenteric ganglia.

I have several times opened the abdomen at divers periods of the digestion, for the purpose of ascertaining whether there was any change in the size of the spleen. Lieutaud observed, in a man who died suddenly after the ingestion of food, a considerable decrease in the volume of the spleen. It was interesting to find out whether this was the case in animals. I must confess that I have only been able to ascertain that which was already known by experimentalists, viz. that the spleen is of very small size at the commencement of the digestion, and increases afterwards in a manner so as to acquire double the size of what it is in its normal state.

Dobson had likewise made the observation that the spleen increased in size during the process of digestion. This fact has been confirmed by the subsequent researches of Baudele-

ben and De Gray, who ascertained that the spleen acquired its maximum volume twelve hours after the ingestion of aliments into the stomach. In the well-fed rabbit the spleen weighs six decigrammes, while in those deprived of food it only weighs two decigrammes. These experiments, repeated in different species, have given the same results.

The injection of water into the veins likewise increases the volume of the spleen.

What are the conclusions to be drawn from these facts? The first idea which occurred to the experimenters was that the increased volume of the spleen, after a copious meal and a liberal use of drink, must be attributed to the absorption by the blood-vessels or lymphatics, which form part of the mucous membrane of the organs of digestion. We cannot share that opinion, at least, without reserve.

The mesenteric veins unite to form the vena porta, and do in no way convey the blood of the spleen. As to the lymphatics, they, perhaps, form anastomoses with those of the spleen; but they in not by any means penetrate into its substance, so that Sasse was unable to admit that explanation, but attributed the fact to a reflex nervous action determined by the presence of aliments in the organs of digestion.

In our opinion the increased volume of the spleen, after meals, depends on a congestion of the splenic vein. When the absorption is effected in the intestinal tube the mesenteric veins, and likewise the vena porta, are gorged with blood; the repletion of these vessels oppose an obstacle to the blood entering from the splenic vein into the vena porta; it then stagnates, and flows back into the spleen, which is an expansive organ, and the function of which consists specially in keeping the blood in reserve.

This is so true that, even from the experiments of Gray, it suffices, by the aid of chloroform, to impede the respiration for half an hour in a horse to expand the spleen with a considerable quantity of blood; the weight amounted to 580 grammes.

After so many useless experiments to discover the functions of the spleen, it may be permitted to ask what is the use of experiments performed on living animals? If, as we maintain, the spleen is destined to enable the arteries of the stomach to receive and contain a greater quantity of blood during the process of digestion, all bloody operations, which have necessarily the effect of perturbating the circulation and the digestion, must derange the circulation in the arteries of the spleen itself, and cannot lead to any serious results.

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Communications and Cases.

THE DISEASE AMONG AMERICAN CATTLE.

In the cattle disease which has existed for some months in the United States of America, said to be communicated by Texas cattle, we have a problem in pathology which may well exercise our acutest powers of ratiocination. No veterinary authority has yet favoured us with an account of the symptoms and morbid changes which distinguish the disease from other epizootic affections. Whether it is inflammatory or congestive in its nature, contagious or sporadic in its origin, we are yet left to conjecture. The only certain thing about it is its extraordinary fatality. Most of the animals attacked die.

Considering the importance of the matter, it is difficult to understand the little concern which, so far as we on this side the Atlantic can judge, is accorded to the inquiry, not only in reference to the immediate results of the plague, but also to its ultimate influence on the exportation of cattle and their products to adjacent and distant parts.

From published accounts we learn that an investigation has taken place under the direction of the Department of Agriculture; we are not told that any veterinary surgeons were required to assist; if they were it is remarkable that their names should be omitted; if they were not, the circumstance is still more inexplicable. Surely there are qualified men in the United States who might be called upon to institute a searching investigation, and to determine what relation, if any, this malady bears to other cattle disease of

the country, which they will have had opportunities of observing.

The report from the Department of Agriculture is published with the name of Mr. Dodge, who is the statistician of the department, and who, as might reasonably be expected, deals almost exclusively with the physical and geographical aspects of the subject.

Mr. Dodge, at the very commencement, startles us by the announcement of the following paradoxes:

The disease is communicated by Texas cattle, and cattle from other parts of the Gulf coast. On the Gulf coast, however, the disease is unknown.

Texas cattle do not themselves suffer from the disease which they communicate to others; but, on the contrary, they are in good health, and even improving in condition at the time. Cattle which are infected by Texas cattle nearly all die, but they never communicate the infection to other cattle with which they may come in contact. In plain terms, the cattle from the Gulf coast are asserted to possess the power of developing spontaneously the germs of a disease in their own systems, and then, instead of bringing it to maturity in its place of origin, communicating it to other cattle, which die, while they, the producers of the seeds of pestilence, escape. The virus of the fever seems to exhaust its potency in the destruction of one generation of victims, and hence the further propagation of the disease is prevented. The natural history of the lower forms of animal life furnishes instances numerous enough of parthenogenesis, but the occurrence of a similar phenomenon in pathology is now for the first time forced upon our notice. We know that the scolex of a tapeworm lies dormant in the organism of its host, and only becomes developed into an active condition of life when conveyed into the body of another animal, reaching which it becomes mature, and then ceases to advance any further; but we had to learn that the germ of a fatal malady might exemplify Steenstrup's idea of alternate generation. All the marvels of this romance of pathology are not yet exhausted. Continuing the statement of the results of his inquiry, Mr. Dodge tells us in effect that the virus which apparently originates in the system of the cattle on the Gulf coast, requires a change of climate for its fructification. The cattle must be travelled from the Gulf coast to a position of considerable elevation, or to a distance of two or three degrees of latitude before they acquire the power to affect others.

If they remain on the Gulf coast the disease is not developed, and if they are removed to other miasmatic sections,

as thc Mississippi bottoms up to the thirty-sixth parallel, they and the animals with which they may be associated remain unaffected.

Treatment is found to possess little or no efficacy in controlling the progress of the disease, which destroys life in most cases very rapidly. *Post-mortem* examination revcals congestion of the brain and also of the endocardium; the kidneys are observed to be highly inflamed, and the bladder although healthy is much distended. The intestines throughout are marked with dark spots, the nature of which is not defined; the spleen and liver are congested.

So far as this rccord of morbid changes is concerned, the cvidcnce is altogether unsatisfactory. No opinion can be formed as to the nature of the affection, nor can even a reasonablc conjecture be hazarded upon the question of infection and contagion. It is asserted that the disease is communicated by Texas cattle, when they have travelled a distance of at least two degrees of latitude from the coast, and arc brought in contact with loeal herds; this, so far, looks like infection, but thc local herds, although fatally attacked themselves, do not communicate the disease to other local herds, and this fact is conclusively in favour of the assumption that the diseasc is non-infectious.

Whichever way we turn we are met by contradictions, and unless an investigation bc madc in the loealities where the affection prevails by competent profcssional men, it is to be feared that the mystery will never be cleared up. Is it quite an ascertained fact that Texas cattle have anything to do with the outbreak? If thcy have, the precise nature of the part they play should be detcrmined.

Beyond everything it is necessary to dccide whether any parts of the diseased animals, the hides, or blood, or any of the secretions possess virulcnt properties, or whether the herbage or fodder which has been in contact with them is prcjudicial to othcr cattle. With thc probability before them of danger arising to the cattle in this country from importation of substances which have been in contact with Ameriean cattle, the Government has restricted the movement of American hay. And under the samc kind of apprehensions, the Irish executive has altogether prohibitcd the importation of hay or straw from America, and also of undressed hides unless they have been properly disinfected. These restrictions, howevcr irksome they may be, are required for our own protection, and can hardly be dispensed with while the present uncertainty respccting the essential character of the disease remains.

ON STRANGULATED INGUINAL AND SCROTAL HERNIA.

By E. Stanley, V.S., 5th Laneers, Lucknow, India.

Having felt the want of practical information on the above subjeet when I first arrived here, I am induced to pen a few lines whieh I am sure will be interesting to some of the junior students of our profession; not that I can relate anything new, as the subjeet is one with whieh our eontinental brethren are familiar. It is, however, the result of my own experienee whieh I am about to reeord.

The sueeessful performanee of the operation for strangulated hernia is one of the greatest triumphs of our art, and proves the veterinarian to be a man of scienee and surgieal skill even in the eyes of the most self-opinionated amateur who knows at least that the patient if unaided must speedily die.

Causes of scrotal hernia.—The abdominal ring giving passage to the spermatie cord is never closed in the horse; henee all stallions are predisposed to this aeeident. The enervating influence of the hot season eauses relaxation of fibre, and the scrotum hangs very pendulously, henee the testieles and their vessels beeome swollen from gravitation of their contents, and a retarded languid circulation suceeeding, eauses the cord to drag on and enlarge the superior opening of the inguinal canal, allowing the ever restless intestine to worm itself into the cavity. This is the only way I can explain the faet of the greatest number of cases oecurring at the beginning of the intensely hot season. Jumping, plunging, kieking, &e., I consider seeondary causes.

Symptoms.—Persistent abdominal pain, more or less acute, depending on the length of time during whieh the intestine has been strangulated, the temperament of patient, &c., but the pain is always without a moment's remission, being equally severe in both forms of the disease. One patient, I remember, lay in a comfortable position for six hours, simply turning his head to his flank at frequent intervals. Usually, however, the animal is very restless, paeing round the box, pawing, lying down, rolling, getting up again, and perspiring profusely. Sometimes the patient will hold up one hind leg and attempt to bite the serotum, or in other eases he will keep persistently backing into a corner. The gait is usually straddling, but may

be quite natural. Perspiration is occasionally confined to the flanks and scrotum.

State of the scrotum.—If there is only a knuckle of intestine through the internal ring, the testicle on the side affected will be drawn close up to the belly, and is usually retained there even though the horse be trotted; the other testicle is raised and lowered uneasily. But if the horse is placed on his back, he draws up the healthy testicle to avoid its being hurt when falling, and this causes the testicle on the diseased side to be *now* the most prominent, because the knuckle of intestine prevents its being raised as high as the healthy one. In scrotal hernia the scrotum will be hard and cold, the testicle cannot be defined, and the cord will feel as one hard mass; internal examination will confirm the diagnosis.

The pulse will be hard and wiry, its rapidity will depend on the duration of the complaint.

Respiration is short and hurried, the nostrils being widely dilated.

Visible membranes highly injected, and early become purplish, depth of hue being a most unfavorable symptom. Manipulation while the horse is standing will afford confirmatory evidence; the testicle is cold and easily felt, the convoluted blood-vessels being engorged and surrounded by interstitial effusion, can be felt suddenly terminating in the straight vessels of the cord just above (at the usual place of division on castration): no intestine can be felt, but the examination causes pain.

Now passing the hand into the rectum, the right hand, if suspected hernia is on the left side, and *vice versâ*, examine carefully, and compare both internal rings; to find them, use the free hand externally, and try to make the fingers touch. The cords will be readily felt passing through the rings. If hernia exists, the bowel is easily felt plugging the opening, and may be pulled (but it is too tightly wedged to be reduced), which instantly causes violent straining, and thus confirms the diagnosis.

Prognosis.—If the heart beats full, strong, and not rapidly, although the maxillary pulse is indistinct, the case is hopeful. The scrotal form is less favourable, as the accident is of longer duration, and the constitutional symptoms are aggravated, but all depends on the operation.

Treatment.—Freely administer sedatives before and after the operation. Opium is my favourite, given in drachm doses every half hour in solution, combined with camphor. The hobbles can usually be put on while the patient is down, and this is advisable as it prevents the risk of bruising the

parts when falling. Prop him on his back with a bundle of bedding tied in a blanket, attach a second rope to the hobbles, and extend both at right angles from his body (my operating box is a division in the stable, surrounded on three sides by a wall five feet high, over which the ropes are passed and held on the outside); the leg on the affected side is liberated, two ropes are put on the heel; one carried directly behind him is pulled upwards and backwards, the other draws the leg outwards and upwards. The body inclines from the side to be operated on. The external abdominal ring or a band of fascia running from the external abdominal region and blending with the fascia lata, is the guide for the point of incision; immediately under this runs the inguinal canal, from one to two inches deep. Cut between the cutaneous veins, which are readily seen, parallel to the fascia alluded to, carry the incision through the skin only, so as just to admit the index finger of the left hand, separate the adipose tissue with the finger, directing it inwards till the inguinal canal is felt (not unlike part of a broom handle), open it by a very small scratch with the point of a scalpel guided on the index finger (it is completely out of sight), and the nail will enlarge the opening to admit the finger, which comes in contact with the bowel or cord. Pass the finger downwards into the belly. Great difficulty will be experienced in getting even the tip of it through the internal ring (which is nothing but a fold of peritoneum) but it feels like a very hard cord and forms the strangulating ligature. Pass the bistoury caché along the finger through this opening, which is only three or four inches from the external orifice (the hook I have added to my instrument prevents the ring slipping off the end on removing the fore finger, and also avoids the danger of wounding the abdominal viscera), the cutting edge being turned forwards and outwards; the spring pressed, the fibres can be felt giving way, the stricture is destroyed and the intense pain relieved. The finger is now readily passed into the belly, and the testicle being raised by an assistant, the bowel is speedily returned; make sure the ring is clear, then close the external wound by ligature to exclude air, remove all restraint, and apply fomentations; in short, treat for inflammation of the bowels, and be prepared for peritonitis.

The operation is the work of a very few minutes, is quite bloodless, and could be performed with a pen-knife.

The patient usually gives a deep sigh of relief, remains lying although the hobbles are removed, the pulse returns at the jaw, and the bluish tint disappears from the mouth in an incredibly short time. I usually foment the abdomen for

three or four hours, give sedatives every half hour, with tobacco smoke and water enemas, as long as the inflammation lasts; it usually subsides in from one to six hours.

Taxis I invariably try before operating, but usually it is valuable time lost. The animal is released as soon as possible, because restraint greatly increases the feverish symptoms, and struggling causes exhaustion, and I feel satisfied hastens a fatal termination.

But is there no fear of the hernia returning now that the opening of the canal is so much larger than before? I have never seen it do so, and believe it is prevented by the sore and inflamed testicle being drawn up so as to plug the opening to a great extent; the thigh also is held close to protect it; and, lastly, in a few hours copious serous effusion, filling the surrounding tissues, forms a natural truss, which lasts until adhesive inflammation completes the cure.

If the parts do not swell, the vitality of the blood is at fault, and the prognosis must be most unfavorable; the patient will surely die, though it may not be for several hours.

I do not castrate and reduce the hernia from the scrotum, because I cannot see any advantages, and I have these objections—the internal ring is beyond reach, either with a bistoury or finger, the inguinal canal cannot be satisfactorily explored, hæmorrhage is a great inconvenience, and the operation is protracted when time is invaluable; but because I am unsuccessful in this mode of operating, I do not wish to condemn more skilful operators. At present I see no necessity for removing the testicle, especially as castration of adults here at certain seasons is almost always fatal,—the patient succumbs to a low fever, and finally dies of inanition.

It must not be forgotten that the accident is a fatal one if left to itself; the many causes which render recovery precarious and uncertain must be borne in mind, or the number of recoveries will appear very limited. I subjoin the following cases with brief remarks on the peculiarities of each, and probable cause of death or recovery.

Case 1. April 24th, 1864.—A hack, five years old, was castrated by scraping the cord. Thermo. 110° in the stable. This is the usual temperature at this season. Eight hours after, the intestine protruded from the scrotum, and several feet rapidly escaped. He was placed on his back, hot water being poured on my hands to clean the part as I returned it. A large loop finally remained filled with gas. While

hesitating about puncturing it, the muscle of the bowel suddenly and slowly contracted at its middle, and, creeping right and left, carried the gas before it, and drew the whole bowel into the abdomen. Acute laminitis supervened. He died from fever and shock forty-eight hours later.

Post-mortem.—No swelling about the scrotum; the cord slightly tumefied from sanguineous effusion; internal ring relaxed, otherwise quite natural. For the first eight feet the single colon was half its normal diameter, and its coats were much thickened by serous effusion; it was of a pinkish hue, though not inflamed; and there was no peritonitis.

Case 2. April, 1864.—A troop horse, seven years old, castrated by scraping. Shortly after he was released a few inches of bowel descended; this was speedily cleaned and returned into the scrotum. The animal strained violently, but pressure on the scrotum prevented the escape of the hernia. He died in twelve hours.

Post-mortem.—A loop of intestine, about a foot, was strangulated, having been forced by his straining through the upper part of the inguinal canal between the fascia of the abdominal muscles. This could not be seen externally.

Case 3. May, 1865.—An old troop-horse, admitted half an hour after morning parade. Although repeatedly examined, no diagnosis could be arrived at. It was my first case of inguinal hernia. He died in fourteen hours.

Post-mortem.—A knuckle of intestine, only three inches long, was strangulated by the internal abdominal ring. The ring was healthy.

Case 4. June, 1867.—A trooper, thirteen years old, admitted three hours after parade. Taxis failing, the testicle was removed; but the bowel remained firmly fixed; and the bistoury being too short to reach the internal ring, I cut down upon the hernia and enlarged the ring; then readily reduced it. This operation had been very tedious, and he died twenty-four hours after from fever and exhaustion, acting on an aged, debilitated frame.

Post-mortem.—The ring was twice its normal size, the peritoneum rather torn, and the cord adherent to the canal by recent lymph. Eight inches of the single colon, near its commencement, were much thickened, and the mucous surface congested with clear lines of demarcation; the rest of the bowels and peritoneum were healthy.

Case 5. July, 1867.—A trooper, fifteen years old, had

hydrocele from a severe blow received three years before, and the scrotum had been very pendulous since. The testicle, which was firmly attached to the scrotum, was dissected away, and eighteen to twenty inches of highly inflamed intestine came into view. An opening was made over the internal ring, the bistoury introduced, a section made, and the bowel with difficulty returned, but without relief. The animal strained violently. Further examination showed the bowel had escaped through the walls of the inguinal canal, and was outside the peritoneum, in contact with the abdominal muscles. To find the ring, enlarge it, draw the intestine up, and return it to the belly, was no easy task, but it was accomplished.

I believe the explanation of the accident is this: the ring had slipped off the end of the bistoury, and the first incision was through the canal wall only; or it may be there was double hernia, caused by the violent straining, namely, first into the scrotum, and secondly through the inguinal canal wall, between the abdominal fascia. He died in eight hours from shock.

Case 6. July, 1867.—A valuable four-years-old charger, admitted three hours after work with inguinal hernia. Taxis failed, and the testicle was removed by actual cautery. On releasing the cord from the clamps the knuckle of intestine slipped back into the abdomen. Low fever supervened. He was not convalescent for two months, having to be kept alive on gruel. This was the result of castration at an unfavorable season. I resolved not to remove the testicle in future, as this reduction was a lucky accident that could scarcely be expected to occur again.

Case 7. September, 1867.—A trooper, thirteen years old, admitted two hours after work with inguinal hernia. I cut down upon it. The knuckle felt like a hard ball, but steady pressure forced it suddenly back, without cutting the ring. The operation did not take five minutes. In three weeks he was at his work, well.

Sequel.—A few weeks later he returned with scrotal abscesses under the integument; these were opened, and he made a good recovery.

Case 8. February, 1868.—An old hack with scrotal hernia, in a dying state when operated on, having been ill ten hours. I cut down on the internal ring, enlarged it with the bistoury, and readily returned the bowel. Though

pain was entirely relieved, he sank and died four hours later from systemic shock and mortification of the bowels.

Post-mortem.—The ring readily admitted three fingers. Three feet of intestine were deeply inflamed with a very distinct line where strangulation had been. The operation was very quickly and thoroughly performed.

Case 9. April, 1868.—A trooper, fourteen years old, admitted two hours after work with inguinal hernia. I made an incision over the ring and dilated the stricture, and the bowel was easily returned, when a second hernia was found through the walls of the canal, which formed a second stricture. This was enlarged, and a mass of bowel was found insinuated between the peritoneum and rectus abdominis muscle, towards the symphysis pubis. This was also returned. Peritonitis supervened four hours after the operation. He died fourteen hours later.

Post-mortem.—Serous abscesses were forming in the scrotal connective tissue; the bowels were in many parts spasmodically contracted. The cavity between the rectus muscle and the peritoneum was filled with plastic lymph.

Case 10. April, 1866.—A trooper, fourteen years old, admitted one hour after work with inguinal hernia. I cut down upon it. The knuckle pitted on pressure, from containing fæces. I expected it to slip back on pressure; instead of doing so, the ring was forced inwards, dragging the canal with it, the peritoneum having separated from its attachment to the abdominal fascia. (I discovered this in searching to find if the ring were clear.) There was some difficulty in getting it back; but this was done by dragging on the testicle, and following the course of the cord till I reached the ring, which was enlarged by the bistoury, and the bowel dropped into the belly. The operation was much more quickly performed than related. The wound closed by first intention. The animal was at work in twelve days, perfectly well.

Sequel.—Two months later he was admitted with an abscess, which opened near the cicatrix, but was confined to the subcutaneous tissue. He is doing very well.

Case 11. August, 1866.—A valuable Arab charger, eight years old. Scrotal hernia occurred at night, but was not reported until nine hours had elapsed. I cut down upon the ring, enlarged it with the bistoury, and easily returned the bowel. Ten days have elapsed, and he is doing well, not having had a bad symptom.

THE QUESTION OF THE DAY: WHAT KIND OF EDUCATION WILL PRODUCE THE MOST EFFICIENT VETERINARY SURGEONS?

By Thomas Greaves, M.R.C.V.S., Manchester.

(*Continued from* p. 672.)

The fourth and last division of the subject is now to be considered, viz., "Does the possession of highly scientific attainments lift the mind of the possessor above the realities of his profession, and dispose him to look down upon the duties required of him as a veterinary practitioner?"

In discussing this question I find I have already in a great measure explained my views upon it, and the conclusion I have arrived at is to the effect that the possession of highly scientific attainments is not necessary to ensure the highest degree of practical usefulness. I have endeavoured to show that we become most useful and efficient men by acquiring the education sketched out in my last paper at page 670—"Then to work at the profession in youth as an apprentice" [this I make a cardinal point], "then study two sessions at the college."

I admit that apprentices to practitioners in purely agricultural districts cannot have the same opportunities as those in towns of seeing large numbers of horse patients, and many diseases in horses more generally affect town horses; and, *vice versâ*, apprentices to town practitioners have not the opportunity of seeing the number or the variety of cases in cattle, and some diseases which may be considered as more generally affecting country horses, especially in the breeding districts. There are two classes of practice, differing very much from one another; and therefore it would be always wise on the part of parents or guardians of a youth to elect that which he is most likely to follow in after life.

I have been informed, on what I deem good authority, that there exists upon the books of the Governors of the Royal Veterinary College a minute, made in committee, to the effect that no youth shall be allowed to enter the college as a student unless he has seen practice, or, in other words, has served an apprenticeship to a veterinary surgeon, and can produce an indenture of apprenticeship.

The disagreement between the Council of the Royal College of Veterinary Surgeons and Professor Dick, in 1844, arose

from a bye-law of the Council, to which, I believe, the professors of the London and Edinburgh Colleges were parties. The said bye-law set forth that no student was eligible to present himself to the Board of Examiners unless he had served an apprenticeship of three years to a veterinary surgeon. When the time of examination approached it was ascertained that only a moiety of the students of either college were eligible. The Council were obdurate, and Professor Dick felt himself compelled to apply to the Highland and Agricultural Society of Scotland to grant him a renewal of their Examining Board, which had been dissolved. This request was granted, and the Board has continued in existence ever since. The Council suspended the obnoxious bye-law, so far as it applied to the London College; hence the grievance because of this preference to the said London College.

What I want to call attention to particularly is this: at that date the desirability and necessity of an apprenticeship to ensure practical usefulness was clearly felt and acknowledged. The want has been continually felt from that day to the present time. The wish that some method should be adopted whereby this want should be supplied is expressed by members in every province in England.

The various presidents of the ten or eleven provincial veterinary medical associations situated in nearly every part of England and Scotland, in their inaugural addresses, and the members of each of these associations, have given expression most distinctly and most earnestly to the same desire.

Now, agitation is only of lasting use when it leads to practical action, and with that object in view I respectfully suggest that each association, and, in fact, the whole body of the profession, shall continue their importunities until this exigency of the case shall have been provided for. A committee of education should be formed, chosen from out the members of the Council of the Royal College of Veterinary Surgeons, to watch and encourage this movement.

There need be no false delicacy in approaching this question. There cannot be the most remote probability of men again falling into the same error that was committed in 1844. Every one connected with that unfortunate affair has, over and over again, expressed his deep and bitter regret at the result. Let us see what Mr. Thomas Walton Mayer says upon this point:

"Instead of waiting upon events—instead of quietly and with great deliberation putting in force the provisions of the charter, laws and bye-laws were made to be repealed, and vain efforts were made to place the profession in a position *at*

once, which can only be accomplished in the course of time. I confess that I was one of those over-zealous individuals who lent my support and influence to the enactment of many laws calculated, as I believed, for the future prosperity of the profession, but which, from the tone and manner of their introduction, had at the time a tendency to promote disunion.

"Most sincerely do I regret this; but hope all will be forgotten and forgiven, and that with perfect unanimity we shall desire to open up the glorious future before us."

Now, gentlemen, what wait we for? Have we not been waiting upon events for the last twenty-four years, and has not the time now arrived when a move should be made, and the goal gained? I can see no difficulty whatever in the way, if only all parties will be actuated by a spirit of fairness and conciliation. It needs only that the Principals of the three colleges, the Governors of the London and Edinburgh Colleges, and the Council of the Royal College of Veterinary Surgeons, come to a clear, distinct, and amicable understanding. I have the most perfect conviction that the Principals of the three colleges experience an ardent desire to advance, in every way possible, the best interests of the profession. I also believe in the good spirit which actuates the members of the Council of the Royal College of Veterinary Surgeons; and I cannot think that the Governors of the colleges would refuse to listen to an application made to them by their respective principals, when it is shown that such is the earnest desire of the great body of the profession. I would respectfully suggest that an agreement should be come to, to the effect that a communication be sent to every member of the profession, conveying an intimation that such an agreement has been entered into, and will be carried out by the respective colleges, viz., that at a certain date, commencement of the session at each college—say, three years or four years hence—no student will be admitted to any of the colleges unless he can show that he has seen practice, and has an indenture of apprenticeship. The communication might contain a request that every member of the profession should make this fact known throughout the district in which he practises. In carrying out this arrangement I do not imagine the colleges would suffer to any extent. I sincerely believe, if this event could be accomplished, the whole body of the profession would rejoice more than in anything else that could happen in our day.

Having accomplished this, I can easily conceive with what facility unanimity could be arrived at with regard to legis-

lating for our profession; a common understanding could readily be arrived at as to what each college desired, and by a little mutual concession a good groundwork might be laid down and adopted, and a Bill got without opposition, which would be not only of great value to us individually, but also a great honour to our common profession. The duties of the parliamentary committee of the council would then be all smooth sailing and very gratifying

The Royal College of Veterinary Surgeons is to all intents and purposes a university; it is not confined to one nation, it may with strict propriety be called a "Veterinary University," it is fully empowered by the charter of incorporation to appoint examiners, grant diplomas and degrees to students (the same as any other university grants to its students), who have studied the regular term or terms at a recognised veterinary college.

It appears to be the desire of many gentlemen in the profession that this university should grant degrees of merit, indicating that the possessor of such degree has attained to a higher eminence in his professional knowledge than the ordinary veterinary surgeon possesses. As this sentiment is, doubtless, a laudable one, and well calculated to elevate the veterinary profession to a higher status, and thereby cause it to be more respected, and probably more valued by the Government, by various learned bodies and by society generally,—I should strongly recommend that the Council of the university should institute such a degree as a veterinary fellowship. In my opinion it is the only degree that the profession can require or the council award. The candidate for the honour of using the initials, F.R.C.V.S., must have possessed the diploma of the Royal College of Veterinary Surgeons three years, have been in practice during the whole of such time, and have studied the higher branches of education, especially those appertaining to physiology, pathology, &c., &c.; he shall then be subjected to a written examination in accordance with rules instituted by the examiners appointed by the council of the university.

A preliminary or initiatory examination as the student enters the college, was first instituted by the prescnt worthy principal of the Royal Veterinary College, and the whole body of the profession applauded the innovation; it commenced simply enough, but has by degrees assumed a character more worthy the intention. It has occurred to me that this examination should be conducted by one or more gentlemen appointed by the Council of the Veterinary University, and approved of by thc principals or professors of

the different colleges; he or they might be selected from the College of Preceptors of London, Glasgow, or Edinburgh; thirty or forty-five minutes would suffice for such an examination upon the subjects referred to in my last paper, at page 670. A certificate from such appointed examiner to the principal of the college would be required, stating that the examination was satisfactory or otherwise; a charge of 10*s.* 6*d.* or one guinea might be the fee fixed upon and paid by the applicant. If the youth proved himself deficient, he must be refused admission into any of the colleges; but if he passed a satisfactory or a very fair examination, he should be put through some practical tests. Let the professors then judge of his capabilities by these tests.

These are my views on veterinary education: if they provoke discussion and inquiry, and in some manner hasten the progress of our profession, "a consummation so devoutly to be wished," the great desire of my heart will be accomplished. I wish not to be esteemed a disturbing spirit, but desire to do what I can to render those in whom I feel so deep an interest more enlightened and happier men.

THE PRINCIPLES OF BOTANY.

By Professor Buckman, F.L.S., F.G.S., &c. &c.

(*Continued from p.* 676.)

Having discussed the general nature of the organs and functions of the stems and leaves of plants, we now proceed to explain the manner in which these are arranged in different families or orders of plants, and this with particular reference to their ascending axes or stems.

It has already been noted that the higher forms of plant life have been called *Exogens* and *Endogens*.

1st. *The Exogenous stem.*—In this we find that the first year of growth will present us with (without being too minute), the three following parts, namely, a central pith, *cellular tissue*, a single circular arrangement of wood, the *ligneous* system, and the bark or *cortical* system.

If we examine the stems of trees more than a year old—say several years—we find the pith not increased, but, on the contrary, not occupying the space that it did in the first; it

cells have been pressed upon all sides, so that a thin section placed under the microscope will show the cells of an hexagonal form.

Here, then, instead of one circle of ligneous matters, we have a number corresponding to the age of the tree. Again, the bark of one year, consisting of a single layer of more or less complicated structure, will also represent rings corresponding in number to the rings of wood.

Now it is between the outer layer of wood as being the newest, and the inner layer of bark as also being the last formed, that the action of growth is maintained; it therefore follows that the central pith and even the older wood may all decay, as we so often see in hollow trees, while the outer layers of bark may scale off or be removed, as in the thick cortical mass of the cork elm, or the cork oak, from which the material known as cork is derived, and yet such trees may flourish for ages.

If, however, these portions remain intact, the stems of the trees increase in size from year to year, and in such cases when they are felled their ages may be ascertained by simply counting the rings of growth.

The size which some of our forest trees may attain and yet be sound, is somewhat remarkable. We once saw an elm tree felled which was twenty-eight feet in circumference, at a yard from the ground, and its wood indicated the age of two centuries.

The pressure, then, of one woody layer upon another, and the filling up and hardening of the inner layers of wood in trees used for timber, causes two kinds of wood, namely, the inner or heart wood—such is the heart of oak; and the outer or sap wood: these also differ in colour, the hard wood being usually much darker than the soft wood.

The stems of trees vary much in the sizes to which they may attain, according to their species, influenced by the soil and climate in which they are grown. The largest trees we have measured give the following dimensions:

	Girth, feet.
The Tortworth Chesnut	57
An elm at the Slade, near Stroud, Gloucester	42
An elm in Oakley Park, Cirencester	38
An oak at Alice Holt Forest	35
Maul's Elm, Cheltenham	34
Several beeches in Gloucestershire	over 30
A willow, near Cirencester	22
An ash „ „	21
A cedar „ „	12
A larch „ „	11.

In Hyde Park and Kensington Gardens are several elms, varying from twenty to thirty feet. The following notice of the age and size of some trees is extracted from Balfour's 'Manual of Botany:'

	Feet.
Trunks of some boababs	90
Trunk of dracœna	45
That of an acer in South Carolina	62
Yew at Hedsor, Bucks, has a diameter of	27

Trees vary much in height. We have seen tulip-trees in North America as much as 150 feet high. It is stated that in France forest-trees attain to from 120 to 130 feet, and this is no uncommon height in this country. As regards the ascertained ages of some trees, Decandolle, among others, gives the following list:

	Years.
Elm	335
Cyprus	400
Sweet Chesnut	600
Cedar	800
Lime	1147
Oak	1500
Yew	1458, 2588, 2820
Adansonia	5000

Such trees as we have been describing are, of course, the giants of vegetation; and yet each bud is, after all, but a young individual in its poloypoidal life; and, indeed, the gardening operation of budding is but transferring the bud of one individual between the wood and bark of another of the same kind, and by this means a new branch of a different sort may be introduced.

Grafting, again, proceeds upon the plan of introducing a branch of one tree to that of another of the same kind, bringing the bark and wood of both in apposition; and in success the cells join, and circulation is maintained by exosmose and endosmose, much, indeed, upon the same principle as in the Talicotian operation principle, as described by Butler:

> "The learned Talicotias, from
> The brawny part of porter's bum,
> Cut supplemental noses, which
> Would last as long as parent breech."—HUDIBRAS.

Wounds in the bark of trees heal by the first intention when their edges are brought in exact apposition, otherwise the injured bark gradually dies and decays, and the wood will be left bare; but after this the exposed wood is gradually

lessened in its area, as new layers of bark are annually deposited inwards; but unless this healing process takes place rapidly, the exposed wood begins to decay, and rotten heart-wood and ultimately a hollow tree will be the result.

> "The wintry wind had passed
> And swept an arm away,
> And winter found a wound at last,
> In which to work decay."

Such wounds then require immediate attention, and in the case of a limb of a forest-tree being broken off by accident, or removed in the process of lopping, the stump should be cut close and even with the trunk; and if not too large the wound may be healed by the extension of the bark; if otherwise, it is advisable to nail a copper plate over the wound to ward off rain, frost, &c.

Injuries are frequently done to trees by poisoning; thus poisonous gases may be inhaled from the atmosphere through the leaves, or poisonous solutions taken up into the trunk through the roots, or the tree may be killed by introducing poisonous metallic salts into wounds in its trunk.

Turner and Christison proved, by a series of experiments, that gases act on plants, both as irritant and narcotic poisons, and they classed hydrochloric acid gas, sulphurous acid gas, nitrous acid gas, and chlorine amongst irritant poisons, and so energetic is their action, that 1 in 9000 or 10,000 parts of air was sufficient to kill a plant in a few hours.

Professor Balfour, in quoting some of these experiments, says that hydrochloric acid gas produced similar effects to those just noted. He says: "When one fifth of an inch was diluted with 10,000 parts of air it acted destructively on laburnum and larch, destroying the whole vegetation in less than two days; even when in quantity not perceptible by the smell, it still acts as an irritant poison.

Watering the roots of plants with solutions of arsenic, or in some cases even with salt water, is sufficient to poison them. Lead in the shape of shot discharged at trees, in emptying guns on coming home, is a constant source of mischief to trees.

The experiments of Messrs. Hyett and Gyde, in dying woods in standing trees, will be interesting to notice in this place. These gentlemen conceived the notion of making wood take different colours by means of chemical action in fluids to be absorbed into the cell and circulation system of the tree, the application of which may be best illustrated by giving an account of the process as seen in action.

A beech-tree, of about fifty years old, had a circle of wood and bark cut away from around its bole. At the bottom edge of the wound was plastered some stiff clay, hollowed out to receive the chemical solution. In this case a solution of sulphate of iron had been first put into this clay gutter, around the stem of a growing tree; and this solution, having been absorbed into the circulation, was followed by a solution of ferrocyanide of potassium, similarly placed. This became absorbed in its turn, and the reaction resulted in a blue-coloured wood, in which the unequal distribution gave a pleasing feathery aspect to the wood, and thus made a colour; and other colours were made by other reactions, which these gentlemen employed in the construction of parquetted floors; and one such, made from wood so experimented upon, ornaments Mr. Hyett's residence at Painswick House.

Now, these cases have not been detailed as a matter of idle curiosity, for inasmuch as they show that plants, like animals, are subject to the action of external media, may we not justly conclude that observations on the well or ill doing of vegetation may and ought to assist us in our conclusions with regard to those creatures that have not only to live in the like media, but also to live upon, for good or evil, the plants which surround them.

As cases in point, we may refer to the prevalence of scour on what are termed the "tart lands" of Somersetshire,—the state of vegetation on farms where splenic apoplexy has prevailed.

Cases of aborting of herds of cattle have, we think, been clearly traced to the presence of poisons, both in the plants on which such animals fed, and in the atmosphere which they breathed; and as these will be detailed in their place, we hope hereafter to show that a knowledge of botany, not merely of plants, their names, and qualities, but of the laws which govern and regulate their growth, is of the greatest possible importance in the care and treatment of the lower as of the higher animals.

LIABILITY OF VETERINARY SURGEONS.

By "Victim."

It appears from some observations in the last number of your journal, that a veterinary surgeon in this country (Ireland) has to defend an action in a court of law, in reference to an operation performed by him upon a colt, which

colt died from the effects of tetanus, a fortnight subsequent to the operation.

Having been the defendant in two actions, I may, perhaps, be permitted to offer a few remarks upon the liability of veterinary surgeons, when death of an animal has ensued upon an operation. I would premise, in the first instance, that veterinary surgeons are sometimes made to defend an action by the owner of a *valueless* brute, which owner is of a litigious disposition. Unfortunately for ourselves, we either do not learn the character of the man from his physiognomy, or, if aware of his litigious disposition, we take no advantage of that knowledge.

In action No. 1 it was alleged that I unskilfully bled a mare in the neck, after which she died. The facts are as follows:—I was the proprietor of a stallion, and engaged a regular groom to attend this animal during the season. One mare, in particular, it seems, was more troublesome than some others, and the owner and my groom determined to bleed the mare, in order to cause her to stand to the horse. The mare was bled, I believe, and died from the effects of phlebitis. I was not apprised of the operation, nor did I know anything of the mare. However, as I was the owner of the horse, and my groom bled the mare, I was called upon to pay the alleged value of the animal. I defended the action, and came out of court with clean hands, but not without difficulty. The law upon this point is not well defined. Counsel for plaintiff argued, that I employed my groom to do all things necessary in such cases, and that bleeding the animal was one of those things. To prove his case, he cited several instances of surgeons' apprentices having bled patients, whose arms became incapacitated for a time, and actions were brought, and damages awarded, &c. This was not allowed by my counsel, because I never undertook to instruct my groom in the art of phlebotomy, nor did I bargain for anything more than the act of attending to the horse during his ordinary work.

Action No. 2 was on account of a young mare whose tibia was fractured during the operation of firing. The mare was carefully and properly cast, which was proved in court. The "jury" found a verdict for defendant.

The only thing for a veterinary surgeon to do is, to *prove* that the operation, from the beginning to the end, was performed in the usual manner and with ordinary care, and a verdict will be in his favour. If, on the contrary, the operation is done in an unskilful or slovenly manner, then he will most assuredly have to pay damages. I remember being

pushed very hard upon one point, viz., as to whether I had *sufficient help*. I think every operator should, previously to casting an animal for an operation, rest assured he has sufficient help, and, if possible, see that his hobbles and other fastenings are in good order. This latter point is not at all times understood. We use these things pretty much in the same way we employ our harness. I think sufficient care is not always manifested in this respect, nor can we at all times know when repairs are required. The harness makers themselves are often at fault.

PROFESSIONAL MORALE.

By Alfred J. Owles, 6th Dragoons, Manchester.

Without entering into the question of how much (or as some put it how little) general education the veterinary student should have received before entering upon the strictly professional studies of the college, I should like to offer a few remarks upon the moral tone which should characterise gentlemen who are members of a useful profession, and who have received, at any rate, the rudiments of a scientific as well as of a general training. I think most persons will allow that a due appreciation, among the members themselves, of the individual responsibility attaching to each member, not only to secure a fair share of pecuniary remuneration, but also to recognise a path of moral rectitude under *all* circumstances, is at least as essential to social advancement as is any advance in the preparatory studies, however much an improved course of education may tend to render the mind sensitive to the influences brought to bear upon it in after life. I would, therefore, invite myself and all who are, or who may become, members of the profession, to ask the question, Am I actuated by such motives and principles in all the relations of life as will entitle me to expect that social status to which members of an honorable profession may aspire? The very nature of the inquiry forbids my entering into minute details, neither do I write in the spirit of censure; but I do believe that there is room for improvement in the direction indicated. We shall remain what we make ourselves, just as we as a body have made ourselves what we are. Is it just to ourselves to overlook and by inference approve of conduct incompatible with the social position it is sought to give the profession in public estimation? Does not such a course act as the greatest barrier to the advance-

ment of veterinary surgeons themselves? Young men entering any calling, if in earnest, strive to attain not only a knowledge of the profession they have chosen, but also to carry into practice that knowledge *agreeably to the principles of ethics recognised among their compeers*, and it is easy to imagine a delicately constituted mind, having all the polish of a righteous purpose, being chilled when brought in contact with the cold selfishness of worldly experience, which, as the profession is now constituted and estimated—for the two are inseparable—gives its possessor what, perhaps, he chiefly seeks, viz., pecuniary success, although he may lack the lamp of science to aid him in the investigation of nature or disease, proving, to our shame, that even now our profession is looked upon by many as merely a matter of routine and experience, requiring neither a scientific training, nor a refined code of morals in its members; hence it appears to me that you must not only improve the materials from which you make veterinary surgeons, but the position of a veterinary surgeon must require as fine and as cultivated a moral perception as prevails among the members of learned communities.

THE VETERINARY MEDICAL BILL.

By John Barker, M.R.C.V.S., Scarborough.

As we are on the eve of a general election, allow me to suggest the desirability of all who have any concern for the future welfare of the profession, bringing the present state of things prominently before the notice of the candidates for parliamentary position. I consider if each member of the College were provided with copies of the Veterinary Medical Bill in its amended form, together with the printed forms that were issued with reference to the protection of veterinary surgeons abroad, a capital opportunity now presents itself of explaining to each individual M.P., whether in fact or in embryo, our present condition, and what it might be were the public protected as well as ourselves. I have always found that the general public have the same idea of us as they have of the medical profession, and take it for granted that, when a man calls himself a veterinary surgeon, or puts the same on his brass plate, he really is one; and hence the frequent outcries of ignorance and incompetence ascribed to the veterinarian, which in nine cases out of ten, if inquired into,

would be found to lie at the door of a quack and not of a qualified veterinary surgeon of any standing. That mistakes are detected by shrewd grooms, horse dealers, &c., I am free to admit, and until we alter our present system of conferring diplomas on young "gentlemen" for no other reason than a two sessions' partial attendance at college, and the capability of answering a certain number of questions, together with the fact of their having paid the necessary fees, mistakes will continue to be made. If it is not disheartening to themselves to afterwards give their services in the country to learn practice before being able to do what their framed diploma says they are fully qualified to do, it is, nevertheless, very humiliating to practical men to hear such things talked of outside the profession, and which practical men know too well is a sly poke and often a home thrust at themselves. Better be able to earn, as Mr. Greaves says, £150 per year with the consolation of knowing that in doing that you have saved your friends and employers three or four times the amount, and that it is the result of your labour, instead of being made up of fees for mere talking or saying do this or do that; the fact is the public will have practical men, of whom there is a scarcity in agricultural districts and provincial towns. Until the bill is passed (not interfering with those already in practice), I think it better to defer the dispute now going on as to the desirability or otherwise of raising the standard of veterinary education, which simply means longer sessions, higher fees, more theory and less practice; and let it take its chance with the general education that is to come in fuller force throughout the country. Meanwhile, if the apprenticeship clause cannot be carried out, let all who cannot show their indentures be made to pass a practical as well as theoretical examination; then we shall have a chance of making a more favorable impression on the public.

DELETERIOUS EFFECTS OF RAW BARLEY.

By Isaac Seaman, M.R.C.V.S., Saffron Walden.

"I never found any bad results happen from turning my ewes or tegs on barley stubbles the last two dry autumns," observes J. T. M., *Mark Lane Express*, March 10th, 1866. The *Veterinarian* for October gives account of the death of seventeen sheep belonging to Mr. Rowles, of Manton, in con-

sequence of eating raw barley, obtained at stubble feed; two years ago Mr. Downing and Mr. Bradshaw lost a number of sheep by death from eating raw barley, and in the same season a large flock of ewes, belonging to Mr. Barnard, of Newport, Essex, were poisoned by raw barley, obtained upon stubbles. The latter flock were about six hours upon the stubbles. The day following that on which the barley had been eaten the sheep appeared to be suffering the most excruciating agony, symptoms of gastritis and laminitis prevailing; to use the words of the shepherd, the sheep appeared "pegg'd to the ground." Their bodies were much swollen. The ears drooped, the sheep looked stupid, and their moanings and groanings might be heard from all parts of the field; when made to move the legs of the sheep tottered, the joints of the limbs appeared inflexible, the animals pitched upon their heads and fell, many never to rise again, dying suddenly as if under the influence of the most powerful narcotic poison. In the examination of the body after death, only a few grains of unbroken barley were found in the rumen. The reticulum contained a small quantity; about half a pint of barley was found in the abomasum, and the small intestines, with the cæcum, contained about the same quantity. Mucous membrane of the fourth stomach was dark brown in colour, with black-brown ecchymoses, these involving all the coats of the stomach. The small intestines presented similar appearances. Lungs were brown-black in colour, and the blood in heart and large blood-vessels was black and fluid.

Impressed with the belief of the asserted result of the cattle-feeding experiments of the Board of Trade, "that raw is superior to malted grain for feeding purposes," some farmers used raw barley for feeding sheep, but the deaths became so frequent they were obliged to discontinue it. In one instance twenty-six out of sixty sheep were poisoned by the raw grain. The sheep first appeared dull, walked stiffly, the body was much swollen, the animals staggered in walking, and in twenty-four hours were paralysed. Many were slaughtered immediately they were noticed to be ill, but so rapid had been the progress of disease that the fourth stomach had become dark in colour, and so much softened that the finger could be easily forced through its walls (in some cases the stomach, the fourth, had burst); the bowels were similarly affected; in the words of the butcher, they were "rotten as a pear." The lungs were in a highly blackened congested state.

R. Frost, Esq., Chester, writing to me observes, "My sheep did very well when fed upon barley prepared as directed by

you (undried malt), but they died when fed upon the raw grain." Science has done much for agriculture, and has the power to do more, but when it teaches that which is erroneous and dangerous, it is not at all surprising if the farmer should distrust the teachings of scientific men generally. Instances of blundering by medical men were numerous enough in the matter of the cattle plague, and attended with disastrous consequences, and equally disastrous have been the consequence of these gentlemen's "meddling and muddling" in the feeding of herbivorous animals.

Pathological Contributions.

FATALITY AMONG CATTLE PRESUMED TO HAVE BEEN CAUSED BY EATING ACORNS.

Some alarm has been created by the sudden appearance, a few weeks back, of a destructive malady among cattle, in many parts of the country, and especially in Kent. Young stock have suffered most, and from the rapid progress of the disease, and the character of the morbid appearances, apprehensions have been entertained of a recurrence of cattle plague. Investigations which we have recently made, however, have satisfactorily proved that the malady is not infectious, and that it depends upon the action of a vegetable poison. In all the cases which have been inquired into the animals had eaten freely of acorns, and subsequently gave evidence of illness at periods varying from four to ten days. The symptoms in some instances were allied to those of cattle plague; there was the same prostration, and sometimes abrasions in the mouth, corresponding to "raw-looking places" seen so frequently in animals affected with the plague. The morbid changes in the stomach and intestines were also remarkable for their resemblance to the lesions of rinderpest. The result of the inquiry is the establishment of a strong conviction that the acorns were the immediate cause of the disease; but we can understand that the first cases which were noticed by members of the profession would have excited uncomfortable suspicion; and considering the danger of delay in dealing with an infectious malady, we may take the liberty to suggest that such equivocal diseases are precisely

those which should be immediately reported to the Veterinary Department.

GASTRO-ENTERITIS IN LAMBS.

In the early part of October our advice was sought in respect of a flock of lambs which were suffering severely from diarrhœa and general debility. The animals, we were informed, after being weaned, were placed on vetches, then on turnips, then, in the beginning of September, on grass which had grown rapidly after the rain. Soon after they were placed on pasture land diarrhœa appeared among them, and with the view to arrest this disease they were put upon wheat-stubble, and had also beans with clover-hay. No improvement following this change of diet, they were removed to a piece of sainfoin; meanwhile, up to the end of September, 200 of them had succumbed to the disease.

When we visited the farm about a hundred of the remainder of the flock were so far prostrated that very slight hopes were entertained of their recovery. The symptoms and morbid appearances were tolerably uniform. Diarrhœa was first observed, quickly followed by prostration, dependent head, and drooping ears; there was frequently an ecchymosed condition of the visible mucous membranes, and the internal temperature was generally 103°. On *post-mortem* examination the lesions were observed to be mainly confined to the digestive canal; in most instances the lining membrane of the abomasum was highly inflamed, sometimes scarlet in colour, and the reticulum occasionally presented a similar appearance. Indications of inflammation were also detected in the intestines; the liver was generally pale, but unaltered in structure; the other organs were healthy.

In reference to causation, it is sufficient to suggest that the whole system of dietary was from the first faulty, although, possibly, during the late extraordinary season, unavoidable. The treatment recommended included the withdrawal of the sheep, as much as possible, from the pastures, the use of pea- and bean-meal with cut hay, avoiding clover-hay, and the exhibition of small doses of carbonate of potash; for the worst cases astringents and tonics were ordered, with a thin emulsion of starch. Under this system of dietary and medicine the sheep are improving; of the hundred which were deemed to be in a nearly hopeless state more than two thirds of them are reported to be going on well, and no fresh attacks have occurred.

EMPHYSEMA OF THE LUNGS, ASSOCIATED WITH TUBERCULOUS DEPOSIT.

Mr. S. J. Rayment, inspector at the Metropolitan Cattle Market, has sent us the following account of disease in a short-horn bull, with portions of the lungs.

Respecting the bull, the particulars are as follows:—He was purchased at Winslow market, on the 16th ult., of a dealer, and was sent to the Cattle Market the next day, apparently in good health. On the 22nd I observed him breathing with difficulty, and a discharge from the eyes and nostrils. He was, however, feeding; and there certainly did not appear to be much the matter with him.

The next day the respiration became much worse, and he was killed early on the morning of the 24th.

On a *post-mortem* examination I found that the lungs were emphysematous, and that depositions had taken place. I immediately forwarded you a portion for further examination.

Externally the lungs had the appearance which was so familiar while cattle plague existed; the areolar tissue between the lobules being distended with air, giving the very peculiar aspect characteristic of interlobular emphysema. A section of the parts showed that there was deposit of a yellow granular kind in the substance of the lobules; and under the microscope the granular matter was found to consist of small and imperfectly-developed cellular bodies of the kind usually discovered in tubercles and scrofulous deposit. In this case the deposition had taken place in the interior of the pulmonary vesicles, the partial obliteration of which had in all probability caused the distension of the interlobular connective tissue. The frequent occurrence of scrofulous deposits in bulls is a fact of great importance to breeders, as there is little doubt that the predisposition to such a low type of morbid product is transmitted to the offspring of scrofulous parents, although it is equally certain that the condition may be induced by the continued action of debilitating influences, especially in respect of young animals.

FATTY DEGENERATION OF THE HEART AND LIVER OF A HORSE: RUPTURE OF THE LIVER, AND DEATH FROM INTERNAL HÆMORRHAGE.—HISTORY OF THE CASE.

Communicated by Messrs. Gowing & Son.

On the 13th instant we were requested to attend a chesnut horse, of the Suffolk breed, aged fourteen years, at the Camden Brewery. The animal, it was stated, had been to work, and came in dull and was off his feed. We administered a febrifuge draught with a diffusible stimulant. At that time he was standing with no more active symptoms than those described. At a quarter past nine the proprietors sent again, saying the horse was considerably worse, and was down and unable to rise. I and my son attended, and upon examination found the pulse feeble, in fact, almost indistinct, the buccal membrane of the mouth was blanched, but there was some vascularity still existing about the visible mucous membrane of the eye. He was struggling to rise, at intervals lying on his near side, occasionally looking round to the off side of his chest, and upon two or three occasions there was violent straining per ano. The respiration was feeble but accelerated. I gave my opinion that there was a rupture of the vessels of the liver, and that the horse was sinking from internal hæmorrhage. My son concurred in my views. The horse was struggling and knocking his head so fearfully against the stall post that I thought, for humanity's sake, it would be well to withdraw him from the stall; this was done with a few assistants, and no sooner was it accomplished and his head laid in a favorable position than he expired.

Post mortem.—On opening the abdomen, before removing the intestines, a large quantity of blood escaped; the intestines being removed the liver was carefully detached; a great quantity of dark clotted blood was within the capsule, but there was also a lesion in that membrane to some considerable extent. The liver appeared much softened in its structure, fatty and granular, and, in my opinion, it had been diseased for some considerable time. The intestines were normal, with the exception of a slight blush or two of congestion. The heart was softened and pallid in colour. The lungs were slightly congested, probably from gravitation of the blood.

A microscopic examination of the heart and liver proved both organs to be affected with fatty degeneration in the most

advanced form. The liver cells were shrunken and filled with minute granules of fat, instead of the globules which are always found in the early stage of the disease. All the fibres of the heart which were examined presented the peculiar granular appearance usual in fatty degeneration of the organ. There can be no doubt that the disease was of long standing, and ultimately led to the animal's death from rupture of the liver and consequent internal hæmorrhage.

SCROFULA IN A PUPPY.

Messrs. Gowing and Son lately forwarded some curious morbid specimens for examination, taken from a bull puppy.

The following are the reported particulars of the case:

The morbid parts forwarded are from a bull puppy between two and three months old; he was brought to me on the 9th instant, much emaciated and wasted; and from the distended, pendulous condition of the abdomen he was apparently suffering from *ascites*. I requested the owner to leave him with me. He died some time in the night.

Post-mortem.—Upon opening the abdomen the cavity was full of serous fluid, and upon slitting open the intestines the mucous membrane was observed to be highly inflamed through its entire course; but the peritoneal surface was only in places slightly discolored.

Some worms were found in the intestinal canal, which was somewhat contracted. The heart and liver I have forwarded to you, as they both give evidence of disease.

A further history of the animal from the owner was to the effect that a fellow-pup died from the same disease, having a distended abdomen, wasting of flesh, and showing the same symptoms as the pup alluded to. The father of these pups was a fine specimen of the bull-dog, weighing upwards of forty pounds; he was of the Wallace breed, a famous strain. Some time ago I operated upon him for a cartilaginous growth on the cartilage of the eye; he did very well, and at that time was in good health and blooming condition. His owner parted with him to a friend. Some months afterwards he was sent to me again, much wasted in flesh, with pendulous abdomen, suffering from the same disease as the pup, having a quantity of serous fluid in the abdominal cavity. Treatment was recommended; but some weeks after I heard from the owner that the favourite and valuable old dog was dead.

This breed of bull-dogs, I believe, now is almost extinct; they have been bred in and in.

The examination of liver and heart led to the detection of a very unusual morbid change. The liver was dark in colour speckled here and there with yellow granules. In form the gland was almost globular; in texture it was compact, with the consistency of an ordinary fatty tumour. On section the cut surface was granular, and mottled with minute yellow specs. A small portion of the enlarged organ was examined under the quarter-inch objective, and the liver-cells were observed to be filled with globules of fat. In addition there was a considerable quantity of deposit of the nature of tubercle.

The heart was also much enlarged; the cavities of both ventricles were distended with coagulated blood. The walls were reduced in thickness at least one half; and under the microscope the fibres were seen to be in the transition state, between the nucleated cell form of the fœtal structure and the striated character of the fully-developed muscle. Between the fibres there was a deposit of granular matter, identical in appearance with that observed in the liver. From the history of the case, there is good reason to believe that the puppy was the subject of scrofula, the result of hereditary transmission intensified, and probably primarily induced by the system of in-and-in breeding. The peculiar feature of the case is the existence of the deposit in the liver and heart—organs which are not ordinarily affected to any serious extent in tuberculosis.

The lungs, spleen, and kidneys were free from disease.

Facts and Observations.

Pleuro-pneumonia at Arlon.—The exudative pleuro-pneumonia has broken out amongst cattle at Latour. Four beasts have been killed, four have died, and twenty-eight are ill. It is said that the disease was imported by a cow bought at Brussels.

New Manures.—In a paper read before the British Association at Norwich, Mr. Read, M.P. for East Norfolk, says:—"Already the constant repetition of the same crop is acting prejudicially to the Norfolk farmers. Clover sickness is a common complaint; and no chemist can tell us what it is

that the clover extracts from the land which our manures do not return to it; nor have they suggested any treatment which has in the slightest degree mitigated the evil. It is feared that turnips are showing signs of a similar ailment; anyhow, it is certain that the same dressing of manure fails to produce the same weight of roots as it did twenty-five years ago."

Seventy-seven Sheep Killed by Lightning.—During a late thunderstorm, Mr. Robert Hooper, of Little Cheverell, near Devizes, had a flock of 554 stock ewes folded on the highest point of the Fore Hill on his farm. On the following morning the shepherd found seventy-seven of them lying dead, and two more in a state of stupor. The lightning had struck the cliff on the edge of which the sheep were folded. The storm was one of extraordinary severity for the time of year, the latter part of September.

Skull of the Mastodon.—It is reported that the skull of a mastodon, measuring 3 feet in length, 2 feet 8 in. in width, and 2 feet across the nostrils, and weighing 100 lbs., has been found in Pike County, Ohio.

Diphtheria.—Dr. Ozenam, in the treatment of diphtheria, attended with the formation of adventitious membranes, uses bromine as a specific, which has an elective action on the pharynx, the *velum pendulum*, and the larynx. He found, by experiment, that bromine first hardened the adventitious membrane, and then reduced it to dust. As a preservative from epidemic diphtheria, Dr. Ozenam administers from ten to twelve drops of bromine in the course of the day in sugar and water, in the proportion of 25 to 50 gms. of the latter per drop. This liquid solution must be kept in the dark, since light would cause the formation of hydrobomic acid. The phial must be kept well stopped, and its contents must be changed as soon as the light amber colour has disappeared. To the patient the solution is administered in drops, hourly, in a tablespoonful of sugar and water, so as to give from one to two grammes of the former in the course of twenty-four hours.

Roast Donkey!—Everybody who has eaten roast donkey has pronounced it excellent. In flavour it is said to resemble turkey, though the colour is considerably darker. The accomplished *gourmet* is aware what animal it is that contributes most largely to the composition of the best sausages in the world—the Lyons sausages. The animal in question is a very clean feeder, cheap, hardy, and subsists easily at little

cost, and it seems within possibility that donkeys may be reared on the poorest commons not only as beasts of burden for the use of the poor, but as a luxurious addition to the banquets of the rich; and since France, Austria, Russia, Belgium, Denmark, and other countries have taken to hippophagy, the donkey may be expected, at an early period, to make a successful invasion of the United Kingdom in a new character.—*Macmillan's Magazine.*

Extraction of Sulphur from the Ore.—The *Amico del Popolo* of Palermo gives an account of some experiments that were made in the neighbourhood of that city on the 5th of August and following day, for extracting sulphur from the ore, by means of steam at a high temperature. This apparatus belonged to the Sociàtà Privilégita per li Zolfi, in Italia, and was fully described in the Society's journal, page 445, and the experiments seem to have been most successful, the sulphur being obtained in about two hours from the introduction of the ore into the apparatus. These experiments were attended by the principal proprietors of sulphur-mines in Sicily, and by others engaged in this industry, and seems to have given great satisfaction to all present.—*Journal of the Society of Arts.*

Ozone for Bleaching.—It is stated, on the authority of the *Produce Markets Review,* that ozone, one of the remarkable discoveries of Schönbein, whose death is recorded in the *Journal of the Society of Arts,* is being practically applied for the purposes of industry, an electric machine being actually employed in Whitechapel for the production of ozone on a large scale, to decolorise sugar, in lieu of filtration through animal charcoal, as hitherto employed.—*Journal of the Society of Arts.*

Inoculation of Plants with Tubercular Matter.—A fact of some interest, if it be confirmed by further experiments, has recently been announced by the French medical journals. M. Telephe Desmartis, a medical experimenter of Bordeaux, has succeeded, it is said, in inoculating upon plants tubercular matter taken from the human lung. The result has been the production of a particular kind of mycelium. This leads M. Desmartis to establish a comparison between tubercle and sphacelia, or ergot of rye.—*Lancet.*

THE VETERINARIAN, NOVEMBER 1, 1868.

Ne quid falsi dicere audeat, ne quid veri non audeat.—CICERO.

THE POSITION OF ARMY VETERINARY SURGEONS.

GREAT dissatisfaction is said to exist among our *confrères* in the army in consequence of recent events connected with their services in the field, and also with respect to their professional position and prospects. From all we can learn, there certainly appears to be reasonable grounds for complaint, and we accept the opportunity now afforded us of calling attention to certain grievances, in the hope that they may be redressed.

In our last impression a letter appeared from a daily contemporary pointing out one of these grievances, which proved to be so marked an instance of injustice or neglect as to elicit the protestations of nearly the whole public press.

As is well known, the long march to and from the capital of Abyssinia was not successfully accomplished without subjecting the Veterinary department of the expedition to a very severe strain, far more trying than that to which the medical branch was exposed ; but so well did the Veterinary department pass through the ordeal that it, with its principal representatives, were most highly praised by the general in command—a circumstance also noticed in our columns. It was, therefore, reasonably expected that, as these gentlemen had so well performed their most arduous duties, a share of the honours and rewards usually bestowed for meritorious and faithful service would be accorded them. But the law of routine placed a barrier in the way. There was *no precedent* for the recognition of the services of Veterinary Surgeons in the army. For the last sixty years they have shared in the toils, dangers, hardships, and victories which have added lustre to the British arms, and exalted the influence, interests, and reputation of our country, but still not a single member of the profession has ever been

considered a fit recipient for public acknowledgment. We need only refer to those wars which are certainly within our knowledge, and notably those in the Crimea, India, and China. It has not been so with others; from the highest to the lowest they have been more or less honoured for their services, and promotion to higher grades, decorations, &c., have been lavished upon every branch of the army except the Veterinary. This certainly is an injustice, for such neglect would be merited if the duties of the Veterinary officers had been improperly or inefficiently performed, or the value of their services were insignificant; the contrary is, however, the truth, as Lord Napier's despatch testifies. There being, therefore, no precedent for doing a simple act of justice to these particular officers, no matter how strongly their efforts may have drawn forth the recommendations of their superiors, it was not to be wondered at, however it might be deplored, that the old story should be again told—the old routine be again religiously adhered to. The Abyssinian war was so exceptional in its more salient features that public attention was constantly directed to its minutest details, and the importance of Veterinary science and value of able Veterinary Surgeons did not escape the notice of newspaper reporters; so that when the Gazette containing the list of those upon whom distinctions and rewards had been published, and it was found that the marked omissions were perhaps more striking than the marked admissions, severe comments were passed upon the system of distributing these tokens of approval. A large number of medical men were included in this list, *but not one Veterinary Surgeon*, in face of the fact that the health of the soldiers had been particularly good, while that of the animals had been especially bad. The strong protests of the press resulted in the issue of another Gazette, doing tardy justice to several of those left out in the first, but as yet no Veterinary Surgeon was noticed. At length, as the list of army promotions in our October number shows, ONE VETERINARY SURGEON WAS PROMOTED FOR DISTINGUISHED SERVICE IN ABYSSINIA. Though this slender acknowledgment came too late to do

anything except to bear witness to the injustice which had been done, it is yet something to congratulate Army Veterinary Surgeons upon having gained. Out of the large number of Veterinary Surgeons who took part in the expedition, and from among those so highly recommended by the general in command, only one has been selected for promotion from one grade to another, while the chief of the Veterinary department in the field has been entirely left out. From what we hear, it appears to be a fixed impression with our army colleagues, that, no matter how they may exert themselves in the field, no matter how greatly their assistance in war may be appreciated and made known by those in whose command they act, at home it avails nothing. The C.B. has never yet been conferred upon a Veterinary Surgeon—the precedent for it must be indicated by the public; and only one Army Veterinary Surgeon has, so far as we are aware, attended a *levée*. While the ensign or cornet fresh from school, or the assistant-surgeon, is quite eligible on these occasions, the Veterinary Surgeon, no matter what his merits may be, whether in the way of scientific attainments or long and distinguished service, is placed on the same footing with the lowest grade of officer who rises from the ranks. This position, we believe, is felt to be an incongruous one, quite incompatible with the recognised status of the Veterinary Surgeon, not only in his regiment, but in the army. Neither are the prospects satisfactory in respect of possible advance in position or increase of emoluments. No Army Veterinary Surgeon now under fourteen years' service can ever expect to be one of the fortunate five who hold higher positions. When he has attained the rank of First Class, which he may expect to do in about twelve or thirteen years' service, he has nothing more to look forward to except the increase of a shilling or so to his daily pay every five years, and to retire from the army, if he survive the trying effects of every climate and the dangers of active service, after twenty-five years, with a pension sufficient to qualify him for the uncomfortable and inconvenient, though truthful, designation of "poor man." That the case of the Army Veterinary Surgeon is not

entirely hopeless, but can be largely remedied, we have every reason to believe, especially when we know that at one time the position of the army surgeon was nearly, if not quite, as unsatisfactory and discouraging. The immense amelioration that has taken place in his status is but of recent date, and was due entirely to the firm and decided stand made by the entire medical profession in favour of wrongs being made right, coupled with a determination not to allow their brethren in the army to be overlooked, underpaid, degraded, or unprovided for. How well they have succeeded the list of distinctions for Abyssinia and other recent campaigns, as well as their present and prospective rank and emoluments, will show. It is to be hoped that the just claims of those members of our profession who don the garments of war, and follow its hitherto (for them) unvarying bad fortune, may be at no distant date conceded.

OPENING OF THE SESSION AT THE ROYAL VETERINARY COLLEGE.

On Thursday, October 1st, the sessional course of instruction was introduced by Assistant-Professor Pritchard in an opening address which he delivered in the theatre of the College, at 12 o'clock, before a large audience of the old and new pupils, with their friends, including many members of the profession, although the gathering was less remarkable in this respect than usual; above forty pupils, we were informed, entered their names on the opening day.

As yet we have not been favoured with a copy of the address, and are therefore unable to place it *in extenso* before our readers; the following condensed report, however, we extract from *The Field* of October 10th.

"The lecturer commenced by remarking on the importance of the first lecture of the session as a means of conveying to the student a general idea of the nature and extent of the work he would be required to undertake during the short period of his pupilage at the College. In the various subjects which would be brought under his

notice in the lecture-room, the laboratory, the dissecting-room, and the infirmary, he would find abundant occupation for his energetic pursuit, and much regret would hereafter be spared him if he made good use of his opportunities as a student. Mr. Pritchard laid great stress upon the necessity for a close application to the practical part of the tuition, especially that relating to the infirmary, counselling a frequent inspection of the sick animals, and a regular system of recording the observations which were made of the phases of disease and the remedies employed."

Review.

Quid sit pulchrum, quid turpe, quid utile, quid non.—Hor.

The Philosophy of the Bath; or, Air and Water in Health and Disease. By Durham Dunlop, M.R.I.A. London: Simpkin, Marshall, and Co.

Some years ago the bath, by which is always meant the hot-air or Turkish bath, became the rage in this country. People suddenly awoke to the conviction that they had been all their lives in a dirty state, and rushed off as one man to be sweated, and rubbed, and kneaded into a condition of purity. Not only men, but horses also, were to be sweated into condition by the new method without loss of power or strain of tendon or muscles, and all the miseries which had hitherto made life hideous were to be sublimated out of existence by the application of air at a temperature considerably above the boiling-point of water. By and by, from some blundering, perhaps, in the system of treatment, some individuals experienced unpleasant, not to say alarming effects; fainting fits and attacks of palpitation began to be apprehended by the timid; it was also found that horses, while they rapidly lost bulk under the sweating system, did not acquire the firmness of muscles which was obtained by the ordinary conditioning process, in which regular exertion was the principal method employed, and at length the Turkish bath shared the fate of all intensely popular institutions, and settled down into a position of mediocrity in public estimation, and up to this moment, in spite of all the extravagant laudations which have been accorded to the institution by enthusiastic sup-

porters, it has not to any extent superseded the ordinary hot-water bath. In reference to the ordinary method of bathing, the author of the 'Philosophy of the Bath' pertinently remarks, "Ordinary bathing or washing may keep the surface of the body in what is considered a state of cleanliness; but as compared with the action of the hot-air bath, such cleanliness is only like removing filth from the *mouth* of a sewer, instead of *flushing the whole sewer itself.*" This is a truism, and one which the public is slow to apprehend; it means, in plain terms, that the hard-working, oft-sweating, and surface-dirty artisan is, in regard of the many miles of tubing in his skin, more cleanly than the most scrupulous adherent to the daily tub system, but withal the man who never sweats!

There is a time-honoured adage to the effect that cold water inside or outside is detrimental to the body when in a state of heat, and, with all respect to our ancestors' memory, it is, as far as it goes, a true statement; under ordinary circumstances, that is to say, when the body is heated by the exertion which exhausts while it elevates the temperature, the suddenly depressing effects of cold may be fatal, but totally different is that warmth generated by contact with hot air. Individually we are not herculean in constitution—in truth, rather the contrary; nevertheless, this is our oft-repeated experience of the bath. After a hard day's work, mental and physical, we have repaired to the hot-air chamber, and felt our spirits rise with the temperature; during the half hour of our sojourn we have drunk with relish and benefit sundry tumblers of the coldest water handed to us from without. After cooling down by the aid of copious frigid ablutions we have taken advantage of the cover of the darkness to walk forth into the fields on a frosty night, with no other covering than "night's sable mantle." Further, we have inveigled sceptical friends into a similar plight, and found that their appreciation of the situation was not less keenly favorable than our own. The author of 'The Bath' goes considerably beyond the merely sanitary view of its effects; he contends that it is not only the best therapeutic, but the only one, that is, when properly applied; he distinguishes between dry hot air and hot vapour, which latter produces a feeling of oppression, unknown when the former method is employed. In the course of the inquiry the author gives an account of the nature and object of hydropathy, the origin of warm bathing, the history of the bath in the middle ages, and its revival in later times. The descriptions are interesting and instructive, occasionally amusing—to wit, the account of the bath in China, quoted

from Mr. Ellis's 'Journal of the Embassy to China in 1816,' referring to a bath at Nankin:

"Near the temple is a public vapour bath, called, or rather miscalled, the Bath of Fragrant Water, where dirty Chinese may be stewed clean for ten chens, or three farthings. The bath is a small room of one hundred feet area, divided into four compartments, and paved with coarse marble. The heat is considerable, and, as the number admitted into the bath has no limits but the capacity of the area, the stench is excessive; altogether I thought it the most disgusting cleansing apparatus I had ever seen, and worthy of this nasty nation."

Mr. Erasmus Wilson observes on this passage, "What would Mr. Ellis say of a country in which there existed no *cleansing apparatus* whatever?—for example, his own."

A primitive form of the bath is thus described by Dr. Tucker, of Sligo:

"It is built of stone and mortar, and brought to a round top. It is sufficiently large for one person to sit in a chair inside, the door being merely large enough to admit a person on his hands and knees. When any of the old people of the neighbourhood are seized with pains, they *at once have recourse to the sweat-house*, which is brought to the proper temperature by placing therein a large turf fire, after the manner of an oven, which is left until it is quite burned down, the door being a flat stone and air-tight, and the roof or outside of the house being covered with clay to the depth of about a foot, to prevent the escape of heat.

"Then the remains of the fire are taken out, the floor is strewn with green rushes, and the person to be cured is escorted to the bath by a second person carrying a pair of blankets. The invalid, having crept in, plants himself, or herself, in a chair, and there remains until the perspiration rolls off in large drops.

"When sufficiently operated on, he, or she, as the case may be, is anxious to get out, and the person in waiting outside swaddles him up in the blankets, and off home, and then to bed. I have heard old people say that they would not have been alive twenty years ago only for the sweating-house."

If this rude apology for a bath would preserve life for twenty years, the modern luxurious appliances ought to ensure a patriarchal age, but then the "old people" might have been mistaken in their estimate of the hygienic effects of the sweating-house. We have heard similar praise bestowed on Morrison's pills. By way of finish, Mr. Dunlop devotes the last chapter to the consideration of the effects of the bath on the lower animals, giving illustrations of its influence upon

cows, sheep, pigs, dogs, horses, and subordinately upon farm servants, and also upon green crops that require to be dried. One quotation from Dr. Haughton seems to us to deserve transcription:

"There is no reason why the lower animals should be 'doctered' upon principles different from those which are applicable to the human race; and until this is acknowledged, veterinary surgery can never emerge from its present degraded condition."

Bless us! What a very short cut to happiness! Why, if this were all, veterinary surgery would have been up in the clouds long ago.

We do not quite follow our author in his worship of the bath, but we go a long way with him in believing that a very powerful and perfectly safe hygienic and therapeutic agent is too much neglected; but then, as he remarks, in effect, everywhere in his book, if we acquire the art of baking ourselves and our animals into a state of newness, just as a baker renovates his stale loaves, what is to become of the science of medicine?

Extracts from British and Foreign Journals.

THE CATTLE PLAGUE IN NORFOLK.

(*Continued from* p. 726.)

NOTWITHSTANDING the warnings the then Government continually received of the pestilential nature and probable effect of the contagious and infectious disease which was prevailing in the metropolis, it was not until the 24th of July—nearly six weeks having passed away since the outbreak in Islington—before they took any action in the matter, when the Privy Council Order, bearing that date, was issued, declaring the disease to be of an *uncertain* nature. Although by this time the *certainty* of its nature had been too well established, as it had extended into Norfolk and several other rural districts, yet the order simply required the owners of cattle *in the metropolis* to give notice to the Clerk of the Privy Council of the existence of any analogous disease in their sheds, inflicting a penalty of £20 for its non-observance.

The effect of this order was decidedly *to spread the disease throughout the country*, as the cowkeepers sent their stock

into the Metropolitan Market for sale rather than risk the destruction of it after giving such information—*no offer of compensation to the owners of cattle destroyed under the order being given, or hope of such held out;* and thus from the Metropolitan Market it was sent into Norfolk and the country districts. Not until the 26th of August, another period of seven weeks having elapsed before the Order in Council was extended into the country, or any steps whatever taken to arrest the progress of the disease in Norfolk by the Government, although it was urged, as it has already been stated, to do so by a deputation sent from this county to the Board of Trade as early as the 7th of August, and it was not until the 29th of September that the power was given to the local authorities to close the fairs and markets of the county; but the value of this part of the order was lessened by taking from the veterinary inspectors the power of slaughtering diseased beasts, which could only now be done in cases where the owners refused to obey their directions as to isolation. Oxen from infected herds were still moved about, under licence from inspectors, from the country to the metropolitan districts, and not unfrequently back again, carrying their pestilential exhalations everywhere in their trail.

It will be seen from the figures in the Government returns that from the outbreak in Norfolk on the 1st July to the 21st of October, when the first Government Report was issued, that there had been 705 attacks, of which 296 were killed and 290 died, from the 21st of October to the 25th of November, a period of only five weeks, so great had been the blundering of the Government that although eight Orders of Council had been already issued, they were utterly effete and powerless, and unable to arrest in any degree the progress of the pest.

The number attacked from the outbreak on the 1st of July to the 25th of November, now amounted to 1709. The increase of the malady in this short period in Norfolk amounted to 1004 beasts. The Orders in Council generally gave great dissatisfaction throughout the county, and the eighth, issued on the 23rd of November, actually permitted animals to be sent by railway both through and out of the infected districts; in fact, the Government was so vacillating and timid in its action, and the Orders in Council so perplexing, that neither magistrates nor inspectors knew from day to day what the law was on the matter, and frequent applications had to be made to Secretary Sir George Grey for explanations of them, and which were often as unsatisfactory as the orders they were intended to elucidate.

On the 23rd of November compulsory slaughter ceased, and was not resumed until the 24th of March in the following year, in this period of four months an increase of attacks to the number of 4225 occurred. From the month of March to July following, when slaughter was resumed, markets and fairs prohibited, infected places declared and dealt with, and licenses established (a period of another four months), the number of attacks was reduced to only 726, against 4225 in the preceding four months, showing a decrease in this period of 3499 animals; or at the rate of more than 850 per month.

This, I submit, convincingly demonstrates the value of the means now employed to stamp out the plague. These were continued, and the result was, in six weeks more the diseased animals amounted in all to only 14, 10 of which were killed and 4 died, the last case of disease being reported on the 15th of September, 1866. Thus the cattle plague in Norfolk was stamped out, having lasted fourteen months and two weeks; and although the pest did not entirely disappear from the kingdom until a year after, viz., in September, 1867, it was never re-introduced into Norfolk.

By the end of December, 1865, the cattle plague had appeared in nineteen divisions in Norfolk, and in more than 120 parishes, and at its extermination only four or five divisions had escaped the infection. Amongst these were Gallow, Greenhoe North, Mitford, and Wayland.

	£	*s.*	*d.*
The total number of oxen lost by the disease was 6380, of the *ascertained* value of	62,417	13	4
To which must be added a sum for those disposed of by forced sales and slaughter, in consequence of contiguity of disease, of the *estimated* value of	25,160	7	5
To which may be added a further sum for waste of root crops and loss of manure, of the *estimated* value of at least	7,000	0	0
To which must be added the expenses of the County Local Authority, shown to be £4181 7*s.* 6*d.*, and those of the Norfolk Cattle Plague Association £1240 11*s.* 9*d.* .	5,421	19	3
Which will bring up the total loss to the county of a sum amounting to	£100,000	0	0

From the figures extracted from the published accounts it will be seen that the compensation paid by the Local Authority of the County was £10,112 2*s.* 2*d.*, whilst its expenses for performing the work were £4181 7*s.* 6*d.*

The Norfolk Cattle Plague Association paid more than double this sum in compensation, viz. £20,368 6*s.* 10*d.* At

a cost for expenses, including a large sum for experiments of less than one-third of the above sum, viz. £1240 11*s.* 9*d.*

The balance in the hands of the Local Authority of the County is £2275 4*s.* 11*d.* That in those of the Norfolk Cattle Plague Association is £4441 4*s.* 9*d.*

I have no intention in making this statement of drawing an unfavorable comparison between the Local Authority of the County and the Norfolk Cattle Plague Association. The circumstances under which they acted were different, and I am ready to admit from my own experience that the greatest care and economy were observed by both, as all those who had any transactions with them can abundantly testify.

It will be seen by reference to the statement that in the Aylsham Division the sum paid in compensation by the Norfolk Cattle Plague Association, was by far the largest amount paid by them in any division during the early period of the disease, namely, £5515 12*s.* 2*d.* This was caused by the want of power to deal with it at its outbreak; had the Government sooner taken action the probability is that it would have been stamped out of the county at a comparatively little loss. *The disease was always two months or more in advance of the Orders in Council.* The spread of the plague was owing to the unrestricted movements of cattle from and to the metropolitan and other markets of the kingdom. Beasts from diseased herds were continually bringing their streams of contagion into Norfolk, and nearly, perhaps, all the early outbreaks could be traced to the above causes. How much then should the Government be censured for its supineness and neglect, or for, it might be, its inability to deal vigorously and promptly with it?

At a much later period of the disease in Norfolk, viz. that which may perhaps be called the second outbreak and which occurred in the division of Clackclose, we are startled to find that an experience of some twelve months was set at nought, and a system established of which a laxity in carrying out the law, and futile attempts to cure by the animals being chloroformed, were the more prominent features (and it looks very much as if the authorities were stupified too by their proximity to this anæsthetic), and the result was a cost to the county of the largest sum yet expended in any division, amounting to no less than £5848 1*s.* 7*d.*

From the foregoing facts and figures we gather that the rinderpest was introduced into Norfolk on the 1st of July, 1865, that it disappeared from the county in the middle of September, after raging for nearly fifteen months; that it

appeared in 19 divisions of the county, in more than 120 parishes; and that there were 880 outbreaks of the disease occurring nearly all over the county; but by far the greater number in the north eastern parts of it; that the disease attacked 6674 animals, 6380 of which were lost, 294 only recovered, of the ascertained value of £62,417 13*s.* 4*d.*, to which must be added the expenses of the County Local Authority and Cattle Plague Association, and the further losses from forced sales, slaughter of healthy cattle, cost for treatment, disinfection, waste of root crop, and diminution of manure, estimated to amount in the aggregate, to little if any short of £100,000 sterling.

This is undoubtedly a large sum, but shows very favorably for this county, when compared with the attacks and results in others.

(*To be continued.*)

THE MILK WE CONSUME. By Cuthbert W. Johnson, F.R.S.

The use of milk naturally commenced with the birth of the first mammalian. The provision thus made by creative wisdom for the nourishment of the new-born is far too remarkable to escape the observation of the most careless. When we proceed to examine the composition of the milk our interest and our admiration are increased. We cannot indeed fail to reflect that it was essential to adapt the food of the young animal, not only to its sustenance, but for its growth. This provision, too, was needed, not only for the enlargement of its purely organic parts, but for its bones also. Now, these requirements are all supplied in milk. We shall presently see that in it is contained an ample supply of matters essential not only to the formation of flesh and fat, but also of the phosphate of lime, of which bones are so largely composed.

We here again see the contrivance of a Divine Architect, by which every requisite is provided, every present and future want anticipated, even before the calf is born. The use by man of the milk of our domestic animals dates from a very early period. We find it noted in the earliest book in our possession (Genesis xviii, 8), and also that butter was then made from it. For many centuries the consumption of milk was confined to its use as a beverage, the manufacture of butter and cheese, or in cookery. It was only about two

centuries since that its great modern employment in tea and coffee commenced. It is chiefly to the use of milk in this way and its composition that I propose to address myself in this paper. One or two valuable reports indeed have been lately made on this subject, and, moreover, the supply of milk to the metropolis and to other densely populated places has become of increasing importance to many of our readers.

Milk as an addition to tea and coffee is unknown in China. In that peculiar empire the infusion is made by putting the tea at the bottom of a cup and pouring upon it boiling water; it is then allowed to cool, and drank without any admixture. Mr. Fortune, who travelled over the tea districts of China, only on one occasion met with sugar and a teaspoon. The Celestials, it appears, regard tea as of a cooling nature, so much so indeed, that the lower orders are wont to counteract this supposed effect by adding to it ginger and common salt.

Before we examine the composition of the cow's milk consumed in London, let us see what is its chemical composition as drawn from the cows of different breeds. This important inqniry not long since engaged the attention of Professor Voelcker. He observes in one of his valuable practical reports (*Jour. Roy. Ag. Soc.*, vol. xxiv, p. 308):

"The Shorthorn, though more particularly distinguished for its precocity and excellence as a meat-producing animal, is nevertheless an excellent milking cow. Some families of even pure-bred Shorthorns are, indeed, distinguished in this respect; for, when well fed, they will yield much milk, and at the same time go on improving in condition. On this account they are preferred by many to Ayrshires, Alderneys, and other breeds of peculiar or local merit, and are becoming more and more the principal dairy breed of England.

"The Yorkshire cow, essentially a Shorthorn, is the favourite breed of cow-keepers in London and other large towns, as it surpasses all others for the quantity of milk it yields. The milk, however, compared with that of the smaller breeds is more watery and less rich in butter, and better suited for direct consumption than for the making of butter or cheese. The statement made by some that pure-bred Shorthorns are not good milkers, is emphatically denied by others. The truth is, there are Shorthorns which are good milkers, and others which are not. As a rule, animals remarkable for the rapidity with which they put on flesh and fatten are not the best milkers, and *vice versâ*. Shorthorns, on the whole, perhaps, are more useful for general dairy purposes than any other breed.

"In 1860, I made some experiments with a view of ascertaining whether pure-bred Shorthorns gave more or less, and better or worse milk, than cross-breds. In the month of September, 1860, three cows from the common dairy stock, and three pedigree Shorthorns, belonging to Mr. Thomas Proctor, Wall's Court, near Bristol, were kept on the same pasture, and the milk from each set of cows carefully measured and subsequently analysed. The pasture was good and the supply of food unlimited.

"The daily produce in milk was as follows:

"Three common dairy cows gave 31 pints in the morning, 21 pints in the evening, making together, 52 pints.

"Three pedigree cows gave 28 pints in the morning, 21 pints in the evening, or together 49 pints.

"The common cows thus produced rather more milk, but the differences were trifling.

Composition of Milk of common Cows (on grass alone) on September 18th, 1860.

"On evaporation, the morning's milk gave:

Water	86·7
Dry matter	13·3
	100·0

"The evening's milk:

Water	86·6
Dry matter	13·4
	100·0

"As there was no appreciable difference in the concentration of the morning's and evening's milk, both were mixed and analysed together, with the following results:

Water	86·65
Butter	3·99
*Casein (curd)	3·47
Milk-sugar	5·11
Mineral matters (ash)	0·78
	100·00
*Containing nitrogen	0·56

"*Composition of Milk of Pedigree Shorthorns (on grass alone) on September 18th*, 1860.—The morning's milk of the pedigree cows contained 87.6 per cent. of water, and 12·4 per cent. of dry matter, and thus was less concentrated than the morning's milk from common cross-bred Shorthorns.

"The evening's milk contained 86·8 per cent. of water,

and 13·2 per cent. of solid matter, and therefore was about as concentrated as the evening's milk of the common cows.

"The following numbers show the detailed composition of this milk in the morning and evening, and the average composition of both:

	Morning.	Evening.	Average.
Water . .	87·60	86·80	87·80
Butter (pure fat) .	3·56	4·16	3·26
*Casein . .	3·19	3·37	3·28
Milk-sugar . .	4·92	4·86	4.89
Mineral matters (ash)	0·73	0·81	0·77
	100·03	100·00	100·00
*Containing nitrogen	0·51	0·54	0·52

"Whether we regard quantity or quality, the three cross-breds in these experiments gave rather more favourable results.

"After some time all the cows, in addition to grass, received 1 lb. of good linseed-cake per head per day, and then yielded:

3 common cows . .	28½ pints of milk in the morning and 18 in the evening, or together 46½ pints.
3 pedigree cows . .	26½ pints of milk in the mogning and 22 in the evening, or together 48½ pints.

"*Composition of mixed morning and evening's Milk on September 24th,* 1860, *Cows on pasture and* 1 *lb. of linseed cake each daily.*

	Common Dairy Cows.	Pedigree Cows.
Water	87·10	86·50
Butter	4·28	4·28
*Casein	3·06	3·25
Milk-sugar . . .	4·84	5·30
Mineral matters (ash) . .	0·72	0·67
	100·00	100·00
*Containing nitrogen . .	0·49	0·52
Percentage of solid matter .	12·90	13·50

"The addition of oil-cake appears to have slightly increased the amount of butter in the milk, but not the yield of milk itself. After the cows were kept for a week upon 1 lb. of oilcake and grass *ad libitum*, 2 lbs. of cake were allowed to each animal. The average yield of milk then was as follows:

3 cows produced 30 pints in the morning and 19 in the evening, or together 49 pints.
3 pedigree cows produced 26½ pints in the morning and 21 in the evening, or together 47½ pints.

"*Composition of the mixed morning and evening's Milk on October 2nd* (*cows fed upon grass and 2 lbs. linseed cake each day*).

	Common Dairy Cows.	Pedigree Cows.
Water	86·90	86·50
Butter	3·96	4·19
*Casein	3·37	3·19
Milk-sugar	4·98	5·34
Mineral matters (ash)	0·70	0·78
	100·00	100·00
*Containing nitrogen	0·54	0·51
Percentage of dry matter	13·10	13·50

"It will be seen that the milk of the cows when kept on grass alone was rich in butter, and generally speaking of more than average concentration. The grass evidently was of good quality, and as the cows had plenty of it, we can well understand that the additional supply of linseed neither increased the yield of milk nor its richness. Indeed the yield of milk slightly diminished in October, when 2 lbs. of oilcake were given, not, I believe, in consequence of the oilcake, but because with the advancing season the produce in milk gradually decreases, whilst its richness perceptibly increases."

We have already alluded to the marvellous provision made for the formation of the bones of the young in its mother's milk.

When milk is evaporated to dryness, and the dry matter burnt, it leaves, says Professor Voelcker, a whitish ash, which consists chiefly of the phosphates of lime (bone earth), and magnesia. The relative proportions of the several substances in 1000 lbs. of the milk of two cows were found by Haidlen to be as follows:

	lbs.	lbs.
Phosphate of lime.	2·31	3·44
Phosphate magnesia	·42	·64
Phosphate of peroxide of iron	·07	·07
Chloride of potassium	1·44	1·83
Common salt	·24	·34
Free soda	·42	·45
	4·90	6·77

As regards the effect of cake and other concentrated food upon the quantity and quality of the milk, the general result of the Professor's experiments appears to be, that, instead of adding to the produce or richness of the milk, "the additional food had a tendency to go into meat or to produce fat. This shows that we cannot increase or improve *ad infinitum*

the quantity or quality of milk. Cows which have a tendency to fatten when supplied with additional food rich in oil and in flesh-forming materials, like linseed-cake, have the power of converting that food into fat; but they do not produce a richer milk, and they may even produce it in smaller quantity. It is this which renders all investigations on the influence of food upon the quantity and quality of milk so extremely difficult. According to theory it would appear that food rich in oily or fatty matter would be extremely useful for producing rich milk; but in practice we sometimes find that it produces fat and flesh instead. Sometimes its influence is even injurious; for cows supplied too abundantly with linseed-cake produce milk which does not make good butter.

"A very curious case of this kind was brought under my notice some time ago by Mr. Barthropp. He had milk which furnished cream that could not be made into butter. When put into the churn it beat up into froth; the casein would not separate from the butter, even in the cold weather of January. Mr. Barthropp had given his cows linseed-cake in considerable quantities; and this cake, perhaps for want of being mixed with a sufficient quantity of good dry hay, evidently had the effect of producing too much liquid fat. On trying to separate as much as possible the solid or crystallised fat from the liquid fat, I found that the latter was very much in excess of the former. This is the most striking instance of the influence of a great excess of oily food on the quality of cream, and consequently on the butter, which has come under my notice.

"In speaking of the quality of cream, I would take this opportunity of remarking, that bad oil-cake, and particularly bad linseed-cake, does a great deal more harm than is generally supposed by dairymen. The inferior taste of the milk is well known. The wholesomeness of the milk of stall-fed cows is further affected by the abominable matters which are occasionally put into linseed-cake. Oilcake crushers seem now to have the privilege of incorporating any kind of oily refuse with linseed-cake; and since this has been the case, we have heard more frequently of diseased milk, and of milk which has a disagreeable flavour. If cows must have extra food, and linseed-cake be preferred for the purpose, the very best and purest kind of cake will answer best.

"Distillery wash, the acid water of starchmakers, and similar refuse, make milk, as is well known, watery; and this dispenses with the necessity of mixing it afterwards with water. Water is not so much added to milk as it is incor-

porated in the animal system before the milk is produced. It is well known that acid water, and especially water that contains lactic acid, has a tendency to produce an abundance of milk. When animals are fed with concentrated food, such as bean-meal or cake, it may, perhaps, be advisable—in the absence of brewers' grains or distillery refuse—two materials which contain lactic acid—to generate some lactic acid by keeping barley-meal for some time in contact with water, and by letting it slightly ferment, some vegetable matter perhaps being added, which has tendency to hasten the process. By doing this, I am inclined to think that concentrated food, like cotton-cake, or bean-meal, or rapecake, would be rendered more digestible—more readily available for the production of milk of a good quality."

Having thus seen what milk is in its pure state, let us next examine its quality as commonly delivered to the consumer in the metropolis. On this head we have an abundance of information in the valuable recent report of Mr. J. C. Morton (see *Veterinarian*, p. 558 *et seq.*).

These facts (and other practical details abound in the paper by Mr. Morton from which I have quoted so much) will hardly fail to interest the reader. To the general student, the provision of milk for the sustenance of the young, its chemical composition, and its vast importance, when we employ it in our daily food, will all afford matters of abounding interest. To the agriculturist such details will reasonably suggest the inquiry as to a better supply of food to the milch cow, and of pure milk to densely populated places, and an improved mode of conveyance from distant dairies; and above all, the best means for its preservation until it reaches the consumer, "from the cow with the iron tail," will not escape his attention.—*Farmers' Magazine.*

Analysis of Continental Journals.

By W. Ernes, M.R.C.V.S., London.

RECUEIL DE MÉDECINE VÉTÉRINAIRE,

January and February, 1868.

Two Csaes of Putrid Infection. By M. L. Trasbot, Chef de Clinique in the Veterinary School of Alfort.

The subject of the first case was an entire horse, which had fallen down in the cart, the shaft having pressed on the

left thigh for a considerable time, the consequence of which was the formation of an enormous abscess, from which, on being opened, escaped more than fifteen litres of white yellowish pus of not unhealthy character: this relieved the patient, and to a great extent removed the lameness, and the case presented nothing unfavorable. The horse was removed to the stable, where it had no sooner arrived than it went down like an inert mass, lay with extended limbs covered with sweat, and trembling, the pulse increased, nostrils distended, &c. These were the general symptoms, after the horse had been brought back to the hospital of the school in a cart on the 7th of January, where it lingered to the 12th, when it died. The autopsy showed a mass of putrefaction throughout. The microscopic examination, with power of 450 diameter, showed that the blood contained an almost equal number to its globules, of the vibrio linela the size of $\frac{1}{200}$ to $\frac{1}{100}$ in length, and $\frac{1}{600}$ in breadth, rounded off at their extremities, refringent in their centre, which formed a transparent line parallel with the borders; on bringing them in contact with a few drops of weak acetic acid they became agitated, and the Brownian movements could be seen. The red globules were mostly irregular, and as if pinked on their outlines. Some leucocytes had preserved their normal characters, and were perfectly spheric, a little transparent, and granulated through the whole of their extent. Others, on the contrary, were a little irregular on their circumference; and their granulations, being collected into two or three small groups, they were open, and had the appearance of small nuclei; these characters, as shown by M. Robin, are not possessed by the white globules of the blood, nor those of laudable pus, when these fluids have not undergone a commencement of fermentation, and no acid has been added to them.

The second case was one of gangrenous pneumonia complicated with pleurisy and septic infection. The subject of this case was a gelding of the English race, about fifteen years old, was brought to the clinic of the hospital on the 24th of January, and died two days after. The symptoms were those of gangrenous pneumony; on the 25th, the day after arrival, he was lying on the sterno-costal region with his limbs half flexed, the neck extended, and the nose resting on the ground. There was an exhalation of putrid odour by the respiration, so strong that the box in which the patient had been placed was infected. The symptoms were unchanged, with the exception of the discharge from the

nose, which had become thinner and more of a greyish colour, and emitted the same penetrating fetid odour as that exhaled by the respiration characteristic of gangrene. Treatment with revulsives was recommended. At 6 p.m. the parietes of the chest were the seat of excessive pain manifested on percussion by plaintive grunts and movements to avoid them. The auscultation denoted on the inferior third a strong bellows sound perfectly characteristic, while there was at the upper part on the right side an exaggerated supplementary murmur; on the left no bruit existed; on the same side the cavernous râle was less distinct, as it was arrested by the pleural effusion. The sounds of the heart were still more obscure: these complications left no hope of recovery, and the animal died the next day. On the autopsy, which was made the day after, extensive infiltrations were found in every part, having a strongly fetid odour. The peritoneal cavity contained several litres of a reddish coloured serum. The thorax contained at least a dozen litres of the same fluid, but it was more turbid; false membranes of recent formation were found in the inferior part of the pleural cavity. The lungs were one mass of decomposition caused by purulent cavities which had destroyed the parenchyma of the lobes. The blood examined microscopically presented the same alteration in the red and white globules as those described in the previous case.

Successful Case of Amputation of the Uterus.

By M. Turquet.

The author recalls to the readers of the *Recueil* a case of successful amputation of the uterus of a cow by Ledru, published about a year ago in that journal. The subject of the present case was a small-sized cow about fourteen years old in bad condition. There was a complete prolapsus of the uterus: an attempt was made to reduce it, but there was much thickening of the muscular coats, and the mucous membrane was highly injected, and of a dark red colour; besides there was a rent in the fundus five to six centimètres in length, which fortunately did not extend to the muscular coat, but from which there was a discharge of dark coloured blood, mixed with serum, which proceeded from the subjacent cellular tissue, which was also very much enlarged and œdematous. The attempt at reduction having failed, the amputation was decided on, permission being readily ob-

tained from the proprietor. The amputation was performed as follows:—A cord about two mètres in length, and the thickness of a goosequill, with two small pieces of wood at the ends, was provided. After having well secured the animal by the aid of two strong men, a knot was formed round the projecting uterus about ten mètres below the valve, then the two ends were held by two assistants, who were directed to pull one against the other so as to form a moderate traction without jerking, and to draw the knot as tight as possible; while I, on my part, with the finger on the knot to appreciate approximately the degree of constriction effected, judging, after a minute or two that it was sufficient to stop the circulation, I made another turn with cord, which I now tied in a knot. To my great satisfaction, the blood ceased to flow soon after having completed the section, which was made about eight centimètres below the ligature. There was scarcely any loss of blood, and the stump disappeared within the vagina. Directly after the animal became agitated, swung its tail in every direction, pawed violently, and suddenly threw itself down on its left side, uttering plaintive grunts, the head was extended on the litter, the respiration was short and accelerated, expressing great anxiety, but there were no accesses of vertigo or convulsive movements, as in the case of the cow of M. Ledru. This state lasted from ten to twelve minutes, ceased gradually, and the patient was quiet half an hour after, in which state it remained during the rest of the day and the following night. The next morning, to my great surprise, I found the cow ruminating. The ligature came away on the 19th; nothing more occurred; the cow suckled her calf, and gave her usual quantity of milk, the same as in the former years, and five months after was put to fattening and lost sight of.

Traumatic Tetanus in a Cow. By M. P. Caillat.

This affection, the author says, is very rare in animals of the bovine species. The cow in question, of the Charolois breed, had received an injury at the base of the horns from a cord attached to a board to prevent the cow from seeing far before her, to keep her from straying out of her pasture; unperceived this cord had remained in the wound for some time: the cow was seven months in calf. The symptoms were—the head and neck extended, the muscles of the cervical region were so hard that not the slightest impression could

be made on them with the fingers, the ears were stiff and erect, and when depressed by force would straighten themselves with a bound, the eyes were fixed, pupils contracted, nostrils dilated; the trismus was so intense, that it was impossible to open the mouth, the outer surfaces of the cheeks were puckered from the rigidity of the masseter muscles, all the other muscles of the body were similarly contracted. She stood with her forelegs wide apart, and hardly flexed her limbs when made to move. The spine flexed still slightly on pressure being applied, the tail was elevated from the perineum, the motion of the hind legs was very limited, and a sort of muscular tremor followed every attempt at locomotion; the voiding of the excrements and the urine, though difficult, was still effected. From time to time a particular noise was heard in the œsophagus, the result of the expulsion of the gas from the rumen, which was somewhat distended. It was afterwards found necessary to puncture it, to liberate the gas, leaving the tube in the opening.

Treatment.—From forty-five to fifty grains of laudanum were administered, by injecting it repeatedly into the mouth by means of a small syringe, it being diluted with some decoction of marsh-mallow, and about the same quantity of ether. The wound was dressed with laudanum, frictions with camphorated oil and laudanum were made along the spine and the masseter muscles. Fumigations were also made under the belly with pailfuls of boiling water two or three times a day, hot bags were put on the loins, and dry friction was resorted to.* The trismus increased to such a degree that the animal could hardly flex the joints of the forelegs, and it fell rather than lay down. This state of things went on from the 9th of June, increasing in intensity to the 16th, when the trismus was so intense that the respiration reached 70 per minute, and sometimes even 80. The same treatment was continued to the 21st, with the exception of adding some glysters containing five grains of laudanum in each. The patient now began to get better, the trismus relaxed, she was able to drink some flour and water, the decubitus was easy, the tremors ceased. The dose of laudanum was now decreased by one half, and afterwards replaced by the cyanuret of potassium, ten centigrammes of which was administered daily by being put on the tongue. From the 24th she had began to eat, but rumination did not take place until the 2nd of July, when she was discharged cured.

* No wonder the trismus increased after all the tormenting of the poor animal.

Mange Transmitted from the Sheep to the Horse, from the Horse to Man, from the Man to the Sheep and Horse.
By L. M. Felizet.

Is there only one species of acarus, varying in size and colour according to the different animals, or has every animal a different species of psoric parasite? If this last hypothesis is the true one, the animalculæ of the mange, as Chabert thinks, and it has been proved by a great number of facts, have the faculty of establishing themselves on any animal, and after several migrations returning to their primitive domicile; that is to say, to the animal from which they first came.

An old mare was put, on account of want of room, with some sheep which were affected with scab. A few weeks after, the mare was found covered with mange, in consequence of which she was sacrificed. The man who skinned her, and carried the skin on his back to protect himself from a shower of rain, became infected with mange, which he communicated to another man who had shared his bed. A few days after he rode a horse without a saddle (bare back), which within a few days after was also affected with mange. Some sheep perfectly free from mange from their birth, became mangy by being tended by shepherds affected with mange.*

ROYAL COLLEGE OF VETERINARY SURGEONS.

QUARTERLY MEETING OF THE COUNCIL, held Oct. 7th, 1868.

Present:—The President, Professors Simonds, Brown, and Assistant-Professor Pritchard; Messrs. J. C. Broad, Ernes, Fleming, Gowing, Greaves, Harpley, Harrison, Hunting, Lawson, Thacker, Wilkinson, Withers, and the Secretary.

The President in the Chair.

The minutes of the preceding meeting were read and confirmed.

The President informed the Council that he had received

* Some years ago, when making researches on the acari of the horse, I became twice infected with the mange from the horse, but I got well without any treatment, and was of opinion that the skin of the human subject was not the habitat of the horse acari, and that they had died in consequence of being transmitted to man.

from Government an official reply to his letter in reference to the attempt to obtain a Scotch charter.

It was moved by *Mr. Wilkinson,* and seconded by *Professor Simonds*—

"That the President's letter, together with the official reply received from the Secretary of the Board of Trade, be entered on the minutes."—Carried.

A somewhat lengthy discussion ensued on the importance of some additional arrangement with regard to the correspondence being made easier of reference.

It was suggested by the Council that copies be made by the Secretary of all important letters, together with the replies, and entered in a book to be kept for that purpose, and numbered in the minute-book, so that they may be more readily referred to. Also that original letters be placed in a guard-book and numbered, the Secretary being authorised to procure suitable books for the above purposes.

Mr. Ernes drew the attention of the Council to a notice which had been given with reference to the examinations, and inquired whether the Council were satisfied with the manner in which they had hitherto been conducted.

It was moved by *Mr. Ernes,* and seconded by *Mr. Fleming*—

"That a committee be appointed to consider the question."

After a considerable discussion—

It was suggested that the appointment of a committee be postponed until the next meeting, in order that Mr. Ernes may have an opportunity of committing his ideas to paper, and that the Professors of the Colleges be consulted.

The motion was then withdrawn.

A letter was read from Mr. Butters, of Exeter, holding the Highland and Agricultural Society's certificate, in which he desired to be informed whether he could have a written examination, or, if an oral one, the time the Examiners would meet in London, and the fee required.

The Secretary stated to the Council that he had informed the applicant that a written examination could not be granted, but that he could present himself before the Special Board in December next, by giving the usual notice, remitting the fee, and producing his Highland and Agricultural Society's certificate on the day of examination.

A letter was then read from the Principal of the Cirencester Agricultural College, in which he desired to be informed whether the Council of the Royal College of Veterinary Surgeons would extend the same privilege to certificated students of his college that was enjoyed by the medical students, viz.

that of attending only one sessional course of lectures previous to their being examined for the diploma of the Royal College of Veterinary Surgeons.

It was considered that this was a subject that could not be discussed by the Council, as they had no control over the students' education.

It was moved by *Professor Brown,* and seconded by *Mr. Greaves*—

"That the Secretary be directed to inform the Principal of the Cirencester College that the question should be addressed to the principals of the veterinary schools, the Council requiring, in the terms of Bye-Law 27, a certificate to the effect that the candidate had been educated at one of the recognised schools."—Carried.

"The Registration Committee brought up their report. It informed the Council that the Committee had met on the previous evening, when the question of the publication of the Register was laid before them, both as regards the yearly issue, the expense of printing, and gratuitous distribution.

"It was considered that, after the examinations, a new edition of the Register should be issued, in order to include the names of gentlemen who passed, also for correcting the names or addresses of persons who had died or changed their residence since the previous issue.

"The Committee having secured the attendance of Mr. Adlard, the printer, that gentleman laid before them an estimate of the value of the type, in the event of the College wishing to purchase it. The valuation was fixed at £50, which would include an insurance of the type by the printer.

"The Committee considered that, in the event of an annual Register being brought out, and the type kept standing, it would be more economical to purchase it on the terms proposed. They also recommended that the yearly issue of the Register should not exceed 250 copies, and that a gratuitous distribution be made to members of the profession only."

After a considerable discussion—

The President then put the following motions before the Council:

"That there be a gratuitous distribution of the Register to members of the profession only, and that all other copies be paid for."—Carried.

The President's next motion was—

"That the type be purchased for the sum of £50."

On being put to the vote, the following was found to be the result, viz. Ayes 9, Noes 1, when the motion was carried.

The President then submitted the recommendation of the Committee—

"That the copies to be now struck off do not exceed 250."

The recommendation was adopted.

The Registrar then proceeded to read over the list of deaths which had been recorded since the last meeting of the Council:

Mr. Edward Mayhew died at Plymouth, in the month of September, after a very long illness. Diploma dated February 6th, 1845. He was elected a member of the Council of the R.C.V.S. in May, 1846, and was the author of several works on veterinary subjects.

Mr. John Eastcott Cornelius, aged 36 years, Torquay, Devon. Diploma dated April 28th, 1859. He died October 15th, of consumption.

Mr. Wm. Barrett, aged 66, E.I.C. Bengal, late of Meriden, Somerset. Diploma dated January 20th, 1844.

Mr. Alfred Huddleston, of Sheffield. Diploma dated August 6th, 1827.

Mr. John Pattinson, of Grantham. Diploma dated July 7th, 1843.

Mr. John Bretherton, of Calcutta. Diploma dated April 30th, 1858.

Mr. George Nicholson Broderick, of Cardiff. Diploma dated May 11th, 1854.

Mr. Harry C. M. Orbell, late of Romford. Diploma dated December 17th, 1856.

Mr. Wm. Moore, of Holland Street, Brixton. Diploma dated 1813.

Mr. Wm. McDermott, E.I.C. Bengal. Diploma dated December 14th, 1835.

Mr. Charles Hewson, of Louth. Diploma dated April 28th, 1858.

The Finance Committee reported that they had examined the vouchers and receipts of payments during the preceding quarter, and found them correct.

The quarterly balance-sheet of the Treasurer's account was then read. The current expenses for the quarter, including Mr. Wilkinson the solicitor's account, amounted to £98 0*s.* 4*d.*, which the Committee recommended should be discharged.

The report was received and adopted.

Cheques were ordered to be drawn for the current expenses, as well as for the payment of the fire insurance due at Christmas.

The attention of the Council was directed to the fact that the Parliamentary agents' bill was not included in the above accounts.

It was moved by *Mr. Wilkinson,* and seconded by *Mr. Withers*—

"That the Secretary be instructed to apply to the Parliamentary agents for their bill."—Carried.

The Secretary then read a letter from the Solicitor of the College, containing instructions in reference to the appointment of Trustees for the investment of the funds of the College.

The subject of the Christmas examinations having been brought forward—

It was resolved that the examination of candidates for the diploma of the Royal College of Veterinary Surgeons should be held on Monday, December 21st, and following days, and that the Treasurer be authorised to draw cheques for the Examiners' fees.

By order of the Council,

WILLIAM HENRY COATES,
Secretary.

THE NORFOLK AND EASTERN COUNTIES VETERINARY MEDICAL ASSOCIATION.

THIS Society held its first quarterly meeting on Tuesday, the 6th inst., at the Norfolk Hotel, Norwich. William Smith, Esq., President, in the chair.; the under-mentioned gentlemen being also present, Messrs. Thomas Greaves, of Manchester, Hon. Associate; J. W. Riches and F. Low, Norwich; W. Shipley, Yarmouth; H. Emms, Foulsham; R. Cleveland, Wymondham; R. Sharpen, Gresham; J. D. Overed, Blofield; G. H. Plumbley, Skeyton; G. G. Whincop, Lowestoft; and D. G. Hunting, Loddon. Letters regretting inability to attend were received from Messrs. Seaman, King, Waters, Young, Hammond, Rattee, Coleman, and Barker.

The Hon. Secretary then read the minutes of the previous meeting, which having been passed and signed, the following gentlemen were duly proposed and unanimously elected members of the Association:—Messrs. F. Simkins, Barrow; J. H. Brown, Wanstead; Thomas Scruby, Royston; and W. Fox, Sudbury.

The President then delivered a very able and elaborate inaugural address, which was listened to with marked attention, and was

frequently applauded. At its conclusion the members requested that it might be forwarded to the Editors of the *Veterinarian* for insertion in that journal.

Mr. Greaves, who was very warmly received, rose to propose a vote of thanks to the President for his interesting and instructive address, which he characterised as one of the best to which it had ever been his privilege to listen, and reflected the highest credit upon its author. After congratulating Mr. Smith upon the ability and deep research evinced by the address, also on being the first President of the first Veterinary Medical Association ever established in this part of the kingdom, and the members on the choice they had made, he forcibly explained the advantages of belonging to these associations, and offered many valuable suggestions on their organisation and management, stating, as the result of his observations, that those whose abilities and attainments were of the highest order, were also those who took the greatest interest in the success of these associations, and were the most anxious to raise the social and scientific status of veterinary surgeons. It gave him unfeigned pleasure to be present on this occasion to fraternise with his professional brethren in the county of Norfolk, and should any gentlemen then present visit Manchester and honour him with a call, he (Mr. Greaves) would promise him as hearty a welcome as he had received at their hands. He trusted that their Association would prove a decided success, and would make its beneficial influence felt not only among themselves and their immediate connections, but also in every place, and on every occasion where the interests of a brother, or of the profession, were at stake. Mr. Greaves then introduced to the notice of those present the National Veterinary Benevolent and Mutual Defence Society, whose objects were fully explained, and its beneficial operations illustrated. He powerfully urged the claims of the Society, and concluded by expressing a hope that additional support would be given by veterinary surgeons residing in this part of the kingdom.

Mr. Overed said that he fully endorsed all that had fallen from their excellent friend Mr. Greaves, in the remarks he had made upon the address of their worthy President. Mr. Greaves had said all that was necessary, so wisely and well, that nothing was required of him further than to second "most cordially" the vote of thanks to Mr. Smith, for his elaborate address. He, however, craved their indulgence for a few moments to speak a word on behalf of the Benevolent and Defence Association, which, he believed, was in every way deserving of their support, inasmuch as its basis rested upon the great principles of justice and mercy so eminently characteristic of England and Englishmen, and by which the Association, in all its operations, sought to be guided. They had heard from Mr. Greaves that no claim had, as yet, been made upon the benevolent fund, whose object was to succour the fatherless and widow, and he trusted the day was far distant when such help would be needed, but it was satisfactory to know that it would be rendered when necessary. The Defence Fund would probably be more in

request, as it was a fact patent to all that cases did occasionally arise by which unprincipled clients on the most frivolous pretences, and without a shadow of justice sought to make capital out of the pocket and reputation of the surgeon, whose want of success in the performance of an operation, or the treatment of a patient, was his misfortune and not his fault, and it is to defend the right and obtain justice in these cases that this fund has been raised, and for which it is alone available. He could offer no better evidence of his sympathy with this movement, and his conviction that such cases can be met more successfully by co-operation than by individual effort, than the fact of having been a member some two years or more; nor could he offer a better testimony to the devotion, liberality, and the largeheartedness of their esteemed friend Mr. Greaves, than the fact of his having promised, on certain conditions, to bequeath to the Association the princely and munificent sum of £1,000. (Applause.)

The vote of thanks having been passed with acclamation, Mr. Smith returned thanks, and expressed to Mr. Greaves his personal obligations, and those of the meeting, for the honour and benefit of his presence, as well as for the valuable assistance rendered them.

Mr. Greaves suitably responded, and wished increased prosperity to the Veterinary Medical Association.

It was announced that the next quarterly meeting will be held at the Norfolk Hotel, Norwich, on Tuesday, January 5th, 1869, when Mr. J. Seaman, of Saffron Walden, will read a paper on "Indigestion."

A vote of thanks to the President terminated the proceedings.

A few of the members afterwards dined together, and spent a very pleasant evening.

JOHN OVERED, *Hon. Secretary.*

THE PRESIDENT'S INAUGURAL ADDRESS.

GENTLEMEN,—In addressing you to-night as members of the Norwich and Eastern Counties Veterinary Association, allow me to thank you cordially for the high honour you have done me in electing me your first President, and especially to congratulate you on the choice you have made in selecting the other office-bearers who, I have no doubt, will heartily unite with you and me in using every available and possible effort to ensure a successful development from this our embryonic state to one of complete and, I hope, perfect form.

The eldest of these societies, of which there are now several in England and one in Scotland, is scarcely six years old, and yet they are a power in the veterinary profession which has been felt and acknowledged on various occasions. I need not inform the meeting that associations of this kind have been for many years in existence in the medical and, I may add, in all other professions having for their objects the advancement of knowledge and the protection and promotion of their special interests; that they have been successful, are still working well, and are yearly producing beneficial results in abundance. It must be a matter of surprise to all, if we stop a moment to reflect, that we in these certainly not the most unenlightened counties in our land, should have remained listless and idle whilst other labourers in the vineyards of science have been carefully tending their vines and gathering in their fruitful produce.

Let me hold out words of hope, and volunteer words of entreaty—those of hope are that the good work, which we have met here to-night to inaugurate,

may be a profitable and enduring one; it rests with you, my professional brethren, to make it so, by attending regularly at the quarterly meetings, by inducing others to join us, and by zealously aiding us in promoting its welfare in all reasonable ways, remembering always the motto inscribed on the seal of our body-corporate—"Vis unita fortior." The words of entreaty are these, let not the example of some of the members of our profession in these eastern counties, in refusing to enter our ranks, have any weight with you; still less, let not the stolid indifference of others influence you, nor the shrugs of the cold shoulders of those men who may have perchance gained independent means by the practice of our common art, and who would not give the value of a doit, either in money or time, to ensure its advancement. Let not, I say, the examples of such men deter you from supporting this movement; and lastly, if any of those who sneer at its pretensions doubt its usefulness, or predicate for it an ephemeral existence should further presume (but it is not perhaps probable) to advise any of your friends not to enter our society, say to all such that which Diogenes said to Alexander, "Get out of my sunshine."

Now, gentlemen, the field of veterinary medical science is so rich, well stocked, and extensive that I find it difficult to select from its luxurious growths the materials best fitted for an inaugural address, but relying on your forbearance and indulgence, I shall seek to interest, if not instruct, you (for I do not presume to do the latter) in a manner after my own fashion, in the hope that if I do not wholly succeed, I may partially do so; and if I fail in both these attempts, I shall apportion a share of the blame which inevitably follows such a result to you, for having selected me to do a duty that many in this society I feel are so much more able and competent to perform.

Most people have a reverence for antiquity, *ergo* such persons should hold the science we cultivate in high esteem, and would perhaps look with more favour upon it if they knew, as we do, how great that antiquity is, although—

> "Imperial Cæsar, dead and turned to clay,
> May stop a hole to keep the wind away."

Yet, those who can boast of an ancestry are in this country especially always held high in esteem; and if a man cannot boast of a mighty lineage, but can tack himself to a grandfather who was not in trade, he becomes joyful, and feels that he has done something towards establishing a *status*. I doubt, however, whether this line of reasoning, when applied to our art, has had a similar result, although, as probably will be seen, we can boast of great antiquity, and can speak with pride, pleasure, and certainty about a great and ancient father (the once celebrated physician Hippocrates) who practised human and veterinary medicine conjointly, and wrote a book on equine diseases, which has been preserved to us. He was of Cos, one of the Cyclades, or islands of the Ægean Sea, and born 460 years before Christ, and we are told studied under his grandfather, Nebrus; however, as we have no record of Nebrus either having studied or taught hippopathology, we must make ourselves content with having had so illustrious a father, and sink all claims upon the grandfather.

We have had also ancient and great brethren, Columella and Vegetius (the latter lived about 300 years after the birth of Christ) whose works on veterinary subjects are still in existence, and have been translated into several languages. I could furnish you with other examples to prove that we (that is, our science) had ancestors good enough to satisfy the most fastidious lovers of genealogical lore; and as you may not possibly hold this matter in such esteem as some, I will, if you please, proceed to draw you from this dazzling light, and to conduct you as quickly as possible through ages of Cimmerian darkness into light again. Well, gentlemen, for about 1300 years after the brilliant dawn of our science, it was lost almost in outer darkness. We know nothing, or next to nothing, about the hands into which it fell, but it is generally believed that it was practised by the horseshoers; and it is well known that human medicine shared a similar fate, by being represented by barbers, who, for a long period were the recognised surgeons of this country, and were known as barber surgeons; hair cutting, shaving, tooth drawing, and bleeding, were amongst the operations performed by them,

as their parti-coloured pole or sign, symbolical of the blood and bandage, hung above their doors denoted, many of which may be seen in almost every town in England at the present time, in grim mockery of their ancient but departed glory. "*Sic transit gloria mundi.*"

It was not until the early part of the 16th century that the light which had for so many centuries been obscured by the dark and dismal mantle of ignorance and error, shone again upon our art, and it was destined for France, in the person Francis the 1st, to lift it and dispel the gloom; he opened the books of the Greeks, which had remained sealed for ages, had them translated into Latin, French, German, and Italian, and thus the long-stored knowledge of antiquity became diffused, and the revival of our art commenced; but it was not until the 17th century that the writings of Vegetius were translated, and the works of Solleysell published, that veterinary medicine received its resuscitative impulse.

In this country, in the reign of Elizabeth, the well-known works of Blundeville and Gervase Markham were first published, and if they did little else than excite a feeling of inquiry into the nature of diseases and their remedies, they effected some good; these books are now often to be met with on book-stalls, and are considered high authorities by grooms and farm servants, and are much sought after by these people.

Snape, farrier to His Majesty Charles the 2nd, gave to this country a really creditable book (for the period), illustrated with large plates, on the anatomy of the horse, the first work of the kind, I believe, that was ever published in England; but in Boardman's 'Dictionary of the Veterinary Art,' published in 1805, will be found some of the most artistic and beautiful anatomical illustrations of the horse extant—indeed, I have seen none to equal them: they are "remarkable for their minuteness and accuracy, beyond any anatomical representations of the human body" that had up to that time appeared, and certainly have not been equalled by the few plates of equine anatomy that have been issued from that time to this.

Then, gentlemen, for nearly another century our art advanced but little, and, notwithstanding the increased value of our horses and live stock, and the greater attention paid to their breeding and rearing in this country than in any other in the world, France, to her honour be it acknowledged, again became the pioneer of veterinary progress; and in 1761 the first veterinary college that was ever established in Europe for the teaching of veterinary medicine was founded under royal patronage at Lyons, the celebrated Bourgelat becoming its first professor. There is an old adage that "out of evil comes good," and perhaps, if my opinions and conclusions be not erroneous, its truth was never better illustrated than in this instance—the evil of the early and middle parts of the last century was our well-known and dreaded enemy, the cattle plague (and all authorities concur in recording the fact that there never was greater devastation caused by it throughout Europe than during this period). The good that came out of this evil was the stimulus given to human thought on the subject of this and other cattle epizootics which had been periodically for so many centuries devastating Europe, the belief of the great necessity for action which followed the consideration of the subject, and the acknowledgment of the unhappy fact that when the "cry for help was loud, none was to be found."

Again we have to thank our neighbours, the French, for making another and a great effort in the right direction, for five years after the school at Lyons was established (that is, in 1766) another, and the largest, and in many respects the noblest institution of the kind in the world, was erected at Alfort, on the banks of the Seine, now called the Imperial School of Veterinary Medicine, of which I shall say a little more about shortly, having visited it in June last, as I did also that at Brussels. In addition to the schools at Alfort and Lyons, there is another at Toulouse, in the south of France.

The good and great work initiated in France was followed by the opening of other veterinary schools or colleges in almost every capital in Europe. Amongst the best are Brussels, Vienna, Berlin, Hanover, Zurich, Naples, Copenhagen, Dresden, Leipsic, Prague, Munich, &c. &c. If I were to attempt to present you with a list of the many eminent men in France and on the Continent who, by

their practical and scientific knowledge, have contributed so largely to the advancement of our art, I am fearful I should weary you with the recital, and especially so, as most of you are already acquainted with their names and labours. I shall, therefore, merely say that in the front of the first rank stand those of Bourgelât, La Fosse, Hurtell d'Arboval, Dupuy, Gérard, and last but not least, the accomplished Bouley, formerly Director and Professor of the Imperial School at Alfort, but who is, I believe, at the present time, Inspector-General of the Veterinary Schools of France.

And now, gentlemen, having drawn a slight and imperfect sketch of the history of our art on the Continent, I will endeavour to take a review of its condition in this "our home, our native land;" and let us indulge in the hope that our experience of the past and our knowledge of the present state of veterinary medicine may in the future stimulate us to make proper and worthy exertions for its improvement, and as "unity is power" I look forward to these associations for that substantial aid which united action and community of feeling always ensure. And that it may be the privilege of the members of this association to promote its advancement is my earnest desire.

The birth of veterinary medical art in this country, if I may be allowed so to designate it, occurred in 1791, when a Frenchman, Charles Vial de St. Bell, after a fruitless attempt three years prior, succeeded in inducing the Odiham Agricultural Society to assist him in establishing in England the institution at St. Pancras in London, well known to us as the Royal Veterinary College, His Grace the Duke of Northumberland becoming its President, and St. Bell its first Professor, who had the advantage of being assisted in his duties by that accomplished, able, and scientific surgeon, Mr. Delabere P. Blaine, whose 'Outlines of Veterinary Medicine' and 'Canine Pathology' are so well known and esteemed, and for many years were the text-books of pathology of the profession, and which, at this somewhat advanced state of our knowledge, are not only now worthy but should have a place in the library of every member.

St. Bell dying in 1793 was succeeded by Messrs. Morecroft and Edward Coleman jointly, the former being a veterinary surgeon practising in London, and the latter a young surgeon who was the pupil of Mr. Cline, then an eminent surgeon in the metropolis who had also another pupil at the same time, Mr. (afterwards the celebrated Sir) Astley Cooper. This connection was the commencement of a friendship between the great human surgeon and the now veterinary Professor, which lasted during the long life of each, and produced results of incalculable advantages to the professor and the profession. Those who are old enough to remember, as I can, the kindness and courtesy extended by Sir Astley to the members of our profession and to the students of the Veterinary College, especially those coming from Norfolk, will award him that meed o gratitude which he so richly deserves. "Peace to the manes" of one of the brightest ornaments of the medical, and to one of the warmest and most disinterested friends of our profession. He was born at Brooke, in this county, and I need not add was one of its worthiest sons.

In the memoranda left by Sir Astley Cooper we find the following allusions, which I extract from the life of the great surgeon, written by his nephew, Mr. Bransby Cooper, which will give you a good idea of what Professor Coleman's attainments were, and how close this friendship I have spoken of was.

At the end of the year 1788 Sir Astley writes thus: "About this time Coleman and Taylor were added to Mr. Cline's party, and now I acquired knowledge really. I was a better anatomist than Coleman,—he was a better theorist than I; and we made the experiments together, which were published in his work on Respiration. This was begun in the idea that mechanical obstruction in the lungs was the cause of death in drowning and hanging; but as he went on, he was obliged to add the want of change in the blood. A multitude of experiments were made, some of which proved curious.* * * *

"Coleman and I attended Mr. Hunter together, and this was exceedingly improving, as we day by day debated all the way home on his doctrines."

Sir Astley Cooper's intimacy with Mr. Coleman, says his biographer in vol. i., p. 185,—"the commencement of which is alluded to in the paragraph from his

memoranda last quoted, ripened into the closest friendship, and remained uninterrupted until the period of Mr. Coleman's death. Their early acquaintance, and the mutual assistance rendered by each to the other in their studies, combined with the gradual ascent which they may be said to have made *pari passu* in public and professional distinction, no doubt contributed to the long continuance of their connection. Mr. Coleman became as distinguished in the particular department of professional study to which he devoted himself as did Sir Astley in his, and may, indeed, be ranked *as the man who first raised veterinary surgery to the character of a science in this country.*"

"My uncle has left among his papers a brief history of Mr. Coleman, a tribute expressive of sentiments alike honorable to his friend and to himself as its author. From this I shall subjoin some extracts, as I have no doubt they will be interesting, inasmuch as they throw a light upon the progress and character of a most eminent and much respected public man, of whom at present, I believe, no biographical record exists. There can be but little doubt also that the enterprising disposition of Mr. Coleman exerted an important influence on the mind of his friend. The numberless experiments undertaken by him at Mr. Cline's in conjunction with his fellow-pupil probably served in a great measure to confirm the early taste of Astley Cooper to physiological research, and perhaps paved the way for those subsequent experiments which not only proved of such great advantage when in his professional practice, but have contributed to throw a lustre around the name of Sir Astley Cooper which can never be separated from it.

"Mr. Coleman was born in the month of June, A.D. 1765, in the county of Kent; in the year 1789 he came to London, and was placed under the guidance of Mr. Cline, and lived in his family with Mr. Astley Cooper; with Mr. Taylor, who married Lady Lucy Stanhope, and was made Comptroller of the Customs by Mr. Pitt; and with Dr. Clarke, who, afterwards imbibing habits of intemperance, died almost destitute.

"Mr. Coleman no sooner came to Mr. Cline's than he again engaged himself in studying the subject of asphyxia, and he made so many experiments upon cats and dogs, and killed such numbers of these animals, that a friend of his once declared he had blocked up Houndsditch. These investigations led to the composition of an essay on suspended animation, which gained him the medal of the Humane Society. He also subsequently published a book on the same subject, which procured for him high reputation.

"About 1792 Mr. Coleman became acquainted with Sir Wathen Waller, Bart., then Mr. Phipps, one of the best oculists this metropolis has produced, and who attended the lectures of Mr. Cline. This acquaintance led him to study carefully the structure of the eye, and to make preparations of that organ, both human and comparative, and thus he was brought to know particularly the peculiarities of the organization of the eye of the horse.

"In 1799 he published his great work upon the 'Anatomy of the Foot of the Horse,' illustrated by numerous and excellent plates. It did him great credit, and was of much use to the veterinary profession.

"But his chief excellence was in his general physiological views. The effects of a confined atmosphere in close stables, the influence of heat and cold upon the horse, the effects of different kinds and quantities of food, the form of the animal best constituted for action, and the uses of the different organizations, were the subjects upon which he chiefly distinguished himself.

"In teaching, as well as in the practice of, his profession, he had the great advantage of being able to apply the principles of Mr. Hunter to veterinary science, and to give to the veterinary student those physiological views which, even now, are but little known out of our country.

"By his scientific researches and mental energies the Veterinary College attained a degree of usefulness and celebrity which exceeded his most sanguine expectations.

"He had the honour to be appointed Veterinary Surgeon-General to the British Cavalry, the duties of which post he performed with the most laudable fidelity, and with such advantage to this country that the number of lives of horses

saved by his means was immense. His scientific views and high character made him to be thought worthy of being elected a Fellow of the Royal Society, and of several other scientific associations.

"In society he was a cheerful and delightful companion, and was on terms of intimacy with Jenner, Woodville, Dr. Cooke, Dr. Wells, Dr. Babington, Mr. Abernethy, Dr. Clarke and his brother, Sir Charles Clarke, Sir F. Chantrey, Sir C. Bell, Sir B. Brodie, Mr. J. H. Green, Dr. Bright, Dr. Paris, Dr. Crawford (the author of the work on 'Animal Heat'), and many other choice spirits and intellectual persons. Whatever is a man's pursuit in life, it is knowledge and moral character which give to him his real rank and position; and in proportion as he possesses these so will he be welcomed in society, respected, and beloved.

"Perhaps in no circumstance was the scientific mind of Mr. Coleman rendered of more importance to this country than in the views which he took respecting the necessity of strict attention to the ventilation of stables."

It is remarked in the work from which I have been quoting that "thousands a year were saved to Government in consequence of Mr. Coleman's annual visits to the stables of the cavalry depôts throughout Britain; and farcy (and it might have been added glanders), which previously had committed most extensive ravages, became nearly erased from the Government returns."

And also "that Mr. Coleman maintained some rather original ideas with respect to the cause of the phenomena usually attending catarrh, or what is commonly called a cold. He believed that it much more frequently originated from residing in heated and crowded rooms, and, therefore, inhaling an impure atmosphere, than from exposure to cold, draughts of air, or other causes to which the symptoms are ordinarily attributed. 'Why,' he used to say, 'who ever heard of a horse taking cold when turned out? But, on the contrary, everybody knows that if you put him into a close stable you will give him a cough directly. Half the young horses that die in London are sacrificed to the pernicious practice adopted of excluding every breath of air from the interior of their stables, merely because they know that by this means the coats of the horses are much more easily kept in fine order, and that a great deal of trouble in grooming is consequently spared.'"

Mr. Bransby Cooper goes on to say, notwithstanding the great public advantage that accrued from the carrying out of these principles, "I must acknowledge, however, that I have sometimes suffered from the professor's extreme love of cold air, for if ever he could manage at his parties to have a window left open unperceived he was delighted; and many a time when I have dined with him I have said, 'Pray, Mr. Coleman, have your ventilators shut, or I shall be blown out of the room,' at which he has laughed, and had the direction of the current changed by stealth, so as to play perhaps upon some other visitor less sensitive than myself.

"I was with my dear old friend twenty-four hours before his death. Pallid, and with every mark of approaching dissolution, excepting loss of spirits, he was lying on a bed between two open windows, his head being without any cap or covering of any sort, while his grey locks were literally floating in the wind; for, although in July, it was cold and blowing weather. Acquainted as I was with his peculiar notions on this subject, I could not help saying, 'My dear sir, you must be cold thus exposed;' and he said, 'No! I have plenty clothes on my bed, a large fire in my room, and with this pure air passing freely to my lungs I shall live a few hours longer; but to-day, I think, is my last. The scene of life, Bransby,' continued he, 'is drawing to a close, and, although my career has been a most happy one, I feel much less regret than I expected at leaving it, for I have full confidence in the mercy of God.' His enunciation proved prophetic, for in less than twenty-fours he was no more."

Pardon me, gentlemen, for these episodical remarks, and now let me resume the thread of my story. After the lapse of a short period Mr. Morecroft retired, and left Mr. Coleman the sole occupant of the professional chair, which he filled for the long period of forty-six years, reflecting an amount of honour and credit upon it that may be, and perhaps is, equalled, but not excelled; he raised the profession to a much higher position in the kingdom than it had before occupied,

and, although some of his opinions were peculiar, and detrimental, as I think, to our interests (I allude to his notions about grooms), yet, on the whole, he deserves our warmest thanks and gratitude for the efforts he made for the advancement of our art, and especially for having obtained the rank of officers in the army for veterinary surgeons, a position which must be admitted by all has done much to raise the status of our profession. He died in July, 1839, at the age of seventy-four.

Professor Coleman was succeeded by Mr. Sewell, who was assistant-professor for many years, and upon the death of Mr. Coleman became the professor. He died in 1853, having been engaged within the walls of the College as a veterinary surgeon and teacher for more than half a century, during fourteen years of which period he held the responsible position of Principal. He had not the high order of intellect of his predecessor, nor had he the like power of imparting instruction; his lectures were tame and less profitable, but he has, notwithstanding these defects, many claims upon us for the quiet and earnest manner in which he filled his position, and for the discoveries he made in veterinary surgery, of which operations of periosteotomy for the relief of pain in splints and other exostoses and neurotomy are the more prominent. His discoveries in the pathology of roaring, which he illustrated by a series of coloured plates of much merit, and gratuitously distributed amongst his pupils and friends, deserve high commendation.

In 1853 the present principal, Mr. Charles Spooner, was elected by the governors of the College to fill up the vacancy, and how well fitted he is to perform the duties with advantage to his pupils and honour to the profession all of us here can amply testify. His earnest, fluent, and even brilliant style of communicating instruction—his great anatomical, physiological, and pathological knowledge—are facts so universally known as to need no further remark. That he may live long to occupy the high position he so worthily fills is the hope and desire, I feel sure, of every member of the veterinary profession.

Of the other veterinary schools in the United Kingdom we will say a few words. In 1819 Mr. Dick in Scotland first began to give lectures on veterinary medicine and surgery, and in 1823 he commenced the systematic teaching of it, under the auspices of the Highland and Agricultural Society and the Senatus Academicus, and shortly after erected the buildings in Clyde Street, Edinburgh, known as the Edinburgh Veterinary College, which he successfully conducted until his death, which took place in April, 1866. Professor Dick, at his demise, nobly bequeathed his entire fortune, together with the buildings of the college, its museum, &c., to the city of Edinburgh, appointing the Lord Provost and Town Council, with others, to be trustees, to be devoted to the teaching, cultivation, and improvement of veterinary science.

Within the last few years two other schools have been opened in Scotland—one in Glasgow, presided over by Mr. McCall; the other in Edinburgh, known as the New Edinburgh Veterinary College, under the direction of Professor John Gamgee. This, which is now closed, did not pay, and, being a joint-stock concern, entailed disastrous losses on the shareholders. Mr. Gamgee has, as you are all, I have no doubt, aware, recently established himself in Bayswater, London, in a building which is called the Albert Veterinary College, where he is teaching the principles of veterinary science; and how well fitted he is to do so most of you well know.

Amongst the many who, by their learning, research, and industry, have enriched our literature, and that have passed from "time into eternity," the most celebrated are Lawrence, Bracey Clarke, Youatt, Percivall, Turner, and Morton.

> "So perish monuments of mortal birth;
> So perish all in turn, save well-recorded worth."

We look in vain among the great departed, or upon the eminent living, English veterinarians, for a titled name; the same amount of intelligence and industry brought to bear on any other profession as that developed in our own would have gained for the possessors titles and an amount of fame we cannot dare to aspire to; but let us console ourselves with the reflection that—

"Honour and worth from no condition rise ;
Act well your part, there all the honour lies."

Having seen that enlightened France led the way in the movement for the revival of our art, let us take a passing glance at one of her schools, that at Alfort ; and when I tell you that the grounds are of greater extent, and the buildings much larger and more imposing, than those of our Alma Mater, I say comparatively little. But a comparison between them is beside the question; you might just as well compare the Louvre to our National Gallery, as far as the fabric is in question ; the lecture, operating, and vivisectional theatres are of large size and convenience, capable of accommodating 400 pupils. I should say the museum is large, well kept, and contains many anatomical and pathological specimens, as well as an ingenious model or contrivance for instruction in obstetrics, similar to the one to be seen in the museum of the school at Brussels; the stables and boxes are commodious and good, well lighted, ventilated, and drained, over which are some of the dormitories for the pupils, who all reside within the walls. The dining-hall and kitchens are worthy of notice, as dinners have to be provided and served daily for something like 300 persons. I must not omit to mention the laboratory, dwellings for the professors and offices ; the canine infirmary, which is spacious, and contained some eighty or more sick and diseased dogs ; the botanic gardens, which are extensive, and well stocked and kept up, as is indeed the whole of this great establishment ; in fine, it is worthy of the name it bears, "The Imperial School of Veterinary Medicine."

There was only one part of this noble establishment that I was not permitted to look into, and this was the vivisectional theatre ; the operations were going on whilst I was there, and had been for several hours. I was informed by Mr. Clayton (a young English student, who had been deputed to show me over the place, and whose urbanity, intelligence, and readiness to afford me information, I have pleasure in acknowledging) that all Englishmen were now prohibited from entering this building in consequence of the disclosures made by an English veterinary surgeon who was admitted into this theatre of horrors, and with whose revelations you are, I have no doubt, acquainted, and who deserves the thanks of society for having exposed the barbarous and unnecessary tortures this practice inflicts on the poor brutes.

Now as to the curriculum ; and for information on this subject I cannot do better than quote from a letter I received on the 29th of September, in this year, from Dr. Edwards Crisp, of Beaufort Street, Chelsea, a gentleman who has paid much attention to the disorders of the lower animals, who was one of the first to investigate the nature of cattle plague here, and who has a work in print on the state of the medical profession, containing an 'Appendix, with an Account of the Curricula, &c., at Alfort, Lyons, and Toulouse.'

"At Alfort a veterinary student must be four entire years at his studies (eighteen months longer than our medical students), and four subjects form a part of his examination that are not required at the examination of our medical students, viz., botany, zoology, histology, and hygiene. Honours and rewards are given by the Government to deserving students."

The Veterinary School at Brussels is spacious, having an excellent laboratory and museum, good library, botanic garden, and accommodation for sick animals ; but it struck me as inferior to the one at Alfort, and the students did not appear to be quite of the same class.

We will proceed to say a few words about the Royal Veterinary College of London, and inquire whether the objects of the founders have been fairly carried out, and how. In a statement printed by the authority of the governors at the time of its foundation, I extract the following passage :—"The anatomical structure of quadrupeds, as horses, cattle, sheep, dogs, &c., the diseases to which they are subject, and the remedies proper to be applied, are investigated and regularly taught ; by which means enlightened practitioners of liberal education, whose study has been devoted to the veterinary art in all its branches, may be gradually dispersed over the kingdom, on whose skill and experience confidence may be securely placed."

Gentlemen, it is our duty to examine before we decide ; and however unpalat-

able the truth may sometimes be, it should, in inquiries like this, be earnestly sought.

"Seize upon truth where'er 'tis found—
Among your friends, among your foes,
On Christian or on heathen ground;
The flower's divine where'er it grows."

At the foundation of this College, we learn, it had one professor and an assistant-professor; we presume it had also an anatomical demonstrator, and for more than half a century this constituted its teaching staff. In 1836, when I entered the college as a student, not a sound was ever heard about the diseases of cattle or sheep, and very little about those of dogs. Messrs. Coleman, Sewell, and Vines, were the only recognised instructors. Professor Coleman lectured on the physiology and pathology of the horse once or twice a week, if his health permitted (he was then very infirm and died within two years); Mr. Sewell twice a week on veterinary surgery; and Mr. Vines demonstrated daily on anatomy. Mr. (afterwards Professor) Morton, who was then dispenser and clerk, gave instructions in his private room on chemistry and pharmacy, he being not permitted to lecture in the theatre, as he was not a recognised teacher. Such pupils as chose to avail themselves of the instruction given by the present professor, who was then an extra-collegiate teacher, at his private house, could of course do so, and a great many did, and profited thereby. A committee of physicians and surgeons, presided over by Sir Astley Cooper, formed the examining board, and granted diplomas to such as passed the examination. There was no laboratory or reading room, but there was in existence the Veterinary Medical Society of the College, which was then, as it is now, a means of instruction at once profitable and agreeable; it possessed a good medical library, but its transactions have ceased to be published, as they once were, in a separate form, and afterwards in the pages of our old friend, *The Veterinarian*.

Having seen what the Veterinary College was in the year 1836, let us look now at what it is in 1868; and who will venture to say that a great and marked improvement has not taken place? The lecture theatre and museum have been enlarged and improved; a library, reading, and other rooms, have been added for the use and convenience of the professors and pupils; a good laboratory and dissecting room erected, and additional boxes built for horses suffering from contagious diseases; sheds have also been added, and the accommodation improved, for the reception of bovine and canine patients.

The staff of the College has been increased from three to five by the appointment of able teachers in cattle pathology, chemistry, and pharmacy. I maintain that these are signs of improvement *within*, and that they are calculated to meet in a degree the exigences of the times, and to extend their influences *without* the walls of our Alma Mater. It must be admitted that the rate of speed over the road of progress has been slow in the *past*, but I look with confidence and hope for its increase in the *present* generation.

"Hope with a goodly prospect feeds the eye,
Shows from a rising ground possession nigh,
Shortens the distance, or o'erlooks it quite—
So easy 'tis to travel with the sight."

The year 1844 marks an era in our history for having given birth to the Royal Charter of Incorporation, which gave us that which we most needed, an autonomy. We had been governed for more than half a century by a power irresponsible, and, to a certain extent, arbitrary, in the constitution of which we had no choice; and although there are some members of the profession whose opinions are generally valuable, who think and have even recently published their belief that, "If no charter had ever been obtained, we should, as far as the advanced state of veterinary science is concerned, been quite in as good a position as we are now; the natural progress of events, and the wants of the community, would have proved a sufficient incentive to our advancement," I for one cannot subscribe to such a doctrine, and I would earnestly, but respectfully, ask you to

pause before you do so. Can a power which, for the first time in our history, has enabled us legally to elect our examining board to grant diplomas to practise, and to appoint our own council and governing body to preside over our affairs and protect our own interest, tend to any other purpose than good?—that is, if rightly used. What endurance the past generation must have been endowed with to have allowed such a state of things to have lasted so long. "Sufferance is the badge of all our tribe," said Shylock, and of most of ours I think I might truly say; but sufferance implies patience, and this is near akin to apathy, and this to sloth; and let it be the business of these societies to awaken us while it is yet morning to toil day by day till we raise on this basis a superstructure worthy to be the temple of veterinary science. All honour and praise to the few earnest and resolute men who by their untiring exertions and services obtained this stepping-stone to our future advancement. Amongst the most prominent of those deserving recognition for their zeal and help, are Messrs. Mayer, father and son, late of Newcastle-under-Lyne. The former has long "gone to the home of his fathers;" the latter is now in the Royal Engineers stationed at Aldershot.

Without admitting for a moment that the Royal Charter is "the summum bonum" or *all that we require*, or that it has fulfilled all the high expectations and aspirations of its supporters, I view it as an *instalment only, and a good one*, of that which we hope some day to obtain from the Government *in full*. It wants to be supplemented by a Bill; and, as you know, attempts have been made to introduce one into Parliament for the purpose of rendering it more useful to us, which for very good reasons I have no doubt has been from time to time withdrawn, but will ultimately, I believe, when the proper time and opportunity arrive, be placed before Parliament again. Legislation may probably give us an Act to prevent persons not having a diploma from calling themselves veterinary surgeons, but we shall not, I fear, induce the Government for years to come, if ever in our time, to sanction in Parliament a measure conferring upon the members of the Royal Veterinary College of Surgeons the exclusive right only of practising the art and science of veterinary medicine.

In Belgium an Act was passed in 1850, prohibiting any one from practising without a diploma; in Holland, Saxony, and Bavaria, similar enactments exist. In Baden, also, and in the small states of Germany, there are penalties for the unauthorised practice of the veterinary profession. In France, I believe, the law goes no farther than to make it illegal to practise veterinary medicine and surgery without a diploma.

The next movements worthy of note for their influence in advancing our art were the formation of the provincial veterinary medical associations in various parts of the United Kingdom, and the assembling on the Continent of the European International and in London of the National Congresses. These are the products of the last six years, and will bring this sketch of the history of veterinary science to a close.

Now, as the objects of these provincial medical associations are pretty well understood and approved, and are set forth under this head in the first page of the books containing their rules, I will only add that primarily the desire of each society is to bring into contact and fellowship all the members of the profession within their respective districts, in order that the experience of each member of the diseases of their several localities may be ventilated and discussed, the value of which, in the event of an outbreak of any enzootic or epizootic disease, or the advent again of cattle plague, will be fully understood and appreciated by them. Secondly, that these periodical gatherings may make them better known to each other, and engender a feeling of greater warmth and cordiality between them; and if any jealousies should have been created, that they may be the means of dispelling them, as well as of rubbing down any little asperities that may have arisen, the growths probably of a mere misunderstanding.

The experience of other societies shows that these objects have been effected, but the drawback in most cases has been the distances that some have to travel to the meetings. When it is considered that we in Norfolk have more than fifty gentlemen eligible to become members practising within this county, and many

more than this number in addition residing within the area of our operations, we ought to enrol a large number of members, and ensure a goodly attendance at each quarterly meeting; and when I reiterate the feeling that was expressed at our first gathering, that the Society was so constituted as to be movable in character, so that it will be enabled, if need be, to come and go, so to speak; or, in other words, whenever it may be for the convenience of a number of its members large enough to warrant such a step being taken, the officers, with such as may please to accompany them, will be ready occasionally to alter the venue. This arrangement we hope will induce veterinary surgeons at a distance to join our ranks, and to prevail on others to do so. The only obstacles to complete success which we have to fear is supineness and want of zeal.

"Zeal and duty are not slow;
But on occasion's forelock watchful wait."

And if that strong incentive, so necessary for the accomplishment of a great and good work, do but animate our brethren in these counties, success is certain and failure impossible.

The first international Congress of Veterinary Surgeons was inaugurated by those indefatigable and talented Professors of Veterinary Medicine, Messrs. John Gamgee, of London, and P. Hering, of Stutgart, and was held in Hamburg in July, 1863. In the circular issued from Edinburgh by the former gentleman, setting forth its objects, we find the following passages:

"The want of accurate statistics relating to the losses sustained by plagues communicated from country to country, in the lines of communication established by trade, is severely felt. It is owing to this want that no measures have been suggested to, or, at all events, adopted by the several Governments of Europe for their individual and mutual benefit, and that Europe is now suffering to a very considerable extent from the system by which one people attempts to save itself from loss by disposing of diseased and infected stock to another.

"In order to fulfil these objects, it is proposed that the representatives from different countries should communicate in the form of essays as much information as possible on the following points:

"First. On the extent to which contagious diseases prevail in their respective countries.

"Secondly. On the imports and exports of live stock, and on the directions in which the plagues chiefly spread in each country.

"Thirdly. On the means recognised by the author of the essay as most effectual to prevent the disease."

The congress was attended by delegates from most of the countries of Europe, Professor Gamgee being the representative of England; and after sitting daily from the 14th to the 18th of July, deliberating upon the majority of the serious diseases affecting animals, the rinderpest occupying the most time and attention, concluded their sittings by pointing out such of them as required veterinary police preventive measures, and were, therefore, especially to be considered in the framing regulations against the spread of epizootics, and by resolving that "the report of the proceedings be printed, submitted to the governments of all states, and that a copy be sent to each member of the congress."

The next International Veterinary Congress, under the sanction of the Emperor of Austria, and with the consent of the ministry of state, was held in Vienna in 1865, the emperor granting a sum of money towards defraying the expenses, when upwards of 150 delegates from all parts of Europe attended, England being represented by Professors Spooner and Gamgee, and by Messrs. Wilkinson, P.V.S., Ernes, and Field Jun. At this great congress subjects of vital importance to our profession were freely discussed, and an amount of scientific information, especially on cattle plague, from the Russian and Austrian professors who were present, elicited, which was at once highly instructive and exhaustive, the assembly concluded by resolving "that the next International Congress of Veterinary Surgeons may deliberate upon the possibility of elevating the profession of veterinary science, especially what conditions are to be fulfilled,

and what preliminary knowledge (judging from the present state of science) is requisite to the study of veterinary medicine."

For further information on these interesting subjects I beg to refer you to Mr. Gamgee's work on 'Cattle Plague,' published in 1866, which contains the official report of these two International Veterinary Congresses, to which I am indebted for most of the facts I have narrated.

The third International Congress was held at Zurich, on the 2nd of September, 1867, and extended to the 8th. (For a condensed report of which *vide The Veterinarian* for November, 1867, from which I have made extracts.) Almost all the states of Europe, even Turkey, sent delegates to the meeting. England was represented by Prof. Simonds and Mr. Ernes; and there were, besides, Prof. Morton and Mr. Wm. Field, then President of the Royal College of Veterinary Surgeons. The mornings were devoted to the business of the congress, the afternoons to excursions devised by the committee and town authorities.

The principal question in the programme was that of the rinderpest, which, owing to the great facilities of the means of transport of cattle, threatens to become universal. The debates on this question were very animated. It was stated that the excoriation of the gums and the redness of the vagina were not diagnostic signs of this disease, though they may be coexistent with it. The congress came to the conclusions that in the last two years no facts had been observed to alter the former views of the malady; that the only means of checking its fearful ravages was the slaughter of all infected and suspected animals; that there was no reason for extending the quarantine beyond the ten days determined by the last Congress of Vienna; that the transmission of the rinderpest to other ruminants had again been often observed, but no authenticated case where it had been communicated to any non-ruminating animals; that there were no instances of it having attacked an animal twice. It was again urged that a commission should be appointed by the different governments, in conjunction with that of Russia, to inquire into the origin and causes of the rinderpest in the locality of the Steppes, where it spontaneously occurs."

The congress next considered the necessity of an official inspection, by competent veterinary surgeons, of all animals destined for consumption as food, as well as the meat in the butchers' shops, for the double object of detecting the early stage of disease and the preservation of public health.

Some of the next points were veterinary organization, the regulation of the practice of veterinary medicine by law, veterinary education, the time required for the study of veterinary medicine, during which not very complimentary allusion was made to the English veterinary schools making veterinary surgeons in two sessions of less than six months each; the decision was that at least three years, of ten months' study in each year, were indispensable for the education of a veterinary surgeon.

There was a little discussion on pleuro-pneumonia, but the unanimous opinion of the contagious and infectious nature of the malady was expressed, against which those police measures which are directed against contagious diseases should be enforced.

You are also aware that a congress of English veterinary surgeons was held in London in 1867, which was well attended, and at which some interesting papers were read and discussed.

And now, gentlemen, thanking you for the attention with which you have listened to my remarks, I shall conclude by saying that this crude and imperfect sketch of the history of our art, from the earliest period to the present time, with the observations interspersed, are intended merely as finger-posts to point out to you the road in which may be found material of sufficient interest to form the subject of future papers for this Association; and that you will select such as are most fitting and instructive, I have not the least doubt, and may God speed you on your journey.

WEST OF SCOTLAND VETERINARY MEDICAL ASSOCIATION.

This Association held its annual meeting in the Athol Hotel, Glasgow, on Wednesday, the 7th ult. Presided over by Mr Anderson, Glasgow.

The following office-bearers were elected for the ensuing year:—Mr. A. Robinson, Greenock, President; Professor Williams, Mr. Sharp Hamell, Vice-Presidents; Mr. James Anderson, Glasgow, Treasurer; Mr. A. Potter, Renfrew, Secretary.

Professor Williams gave a report of the "Epizootic amongst Cattle in America,"—said by some to be rinderpest. The Professor stated that he was of opinion, from the meagre information he could gather, that it was not that disease; before pronouncing definitely he would like further evidence, and hoped by next meeting to be able to give a more lengthened account of the malady.

It was proposed by *Mr. Anderson*, and carried unanimously, "That a general meeting of the profession be called in Edinburgh, on as early a date as possible, to take into consideration the present and future condition of the profession in Scotland, particularly with regard to a Scottish Charter."

A. Potter, *Secretary*.

YORKSHIRE VETERINARY MEDICAL SOCIETY.

The last Quarterly Meeting of the Yorkshire Veterinary Medical Society was held at the Queen's Hotel, yesterday, October 22nd, the President, Mr. Thomas Secker, in the chair. After the usual preliminary business, Mr. Fearnley, of Leeds, read an instructive paper upon "The Examination of Horses as to Soundness;" the paper being only partially debated upon owing to want of time, the further discussion was adjourned until the annual meeting in January. Mr. M. E. Naylor, of Wakefield, was unanimously elected the president for the ensuing year; Messrs. Pratt, Masham; Ball, Otley; and Walker, Bradford, were elected vice-presidents: Mr. Broughton, Leeds, re-elected secretary; Mr.

Dray, Leeds, re-elected treasurer. The usual vote of thanks to the retiring officers was unanimously passed.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

PRIZE ESSAY AWARD.

The last number of the journal of this Society, just issued, announces that a prize of £20 has been awarded to Mr. Henry Hale Dixon, 8, Warwick Gardens, Kensington, for his essay on the Leicester Breed of Sheep. The same journal contains Mr. Dixon's prize essay on the Rise and Progress of Hereford Cattle.

OBITUARY.

We have to record the death of Mr. Edward Mayhew, M.R.C.V.S., who expired at Plymouth in the month of September last, after a long illness. Mr. Mayhew obtained his diploma in February, 1845, and was elected a Member of Council in May, 1846. He was well known as the author of several veterinary works.

We have also to announce the death, on October 15th, of Mr. John Eastcott Cornelius, M.R.C.V.S., aged thirty-six years, at Torquay, Devon. His diploma is dated April 28th, 1859.

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Communications and Cases.

OPENING OF THE SESSION 1868-69 AT THE ROYAL VETERINARY COLLEGE. INTRODUCTORY ADDRESS BY ASSISTANT-PROFESSOR PRITCHARD.

Gentlemen,—We meet here this morning to inaugurate the session 1868-69, by the delivery of an introductory address. If my task possesses a difficulty it mainly consists in my having to present to you an old picture in such a light as to give it a new appearance. My theme, in other words, has been so frequently ventilated that it offers little or nothing new to be dilated upon. Do not, however, suppose that I am slow to properly estimate the importance to be attached to a lecture of this kind, or the responsibility with which I am now mantled; as, on the contrary, I consider the introductory lecture the most important of the session, and that if one lecture claims closer and better attention, on the part of the class, than another, it is the opening one. The fresh faces that I see before me remind me that, although the part I have to play this morning has been represented many times before, as much care is required to properly perform my task, and as much detail is necessary, as though this were the opening of the first session of the College. But what is the end to be gained by this lecture? I answer:—Many of you for the first time take your seats in this theatre with an intention, and a full determination, I hope, of ultimately possessing that professional knowledge which is

indispensably requisite to enable you to take your stand as scientific veterinary surgeons; while others, who have already spent a period here, having a similar purpose in view, have returned to continue their studies, and thus attain the required efficiency. To the first named I have to point out the particular course which they have to pursue, and the scientific subjects with which they have to make themselves acquainted; and to advise them as to the method they should adopt, so as to steer clear of the obstacles to improvement which may beset them in their efforts to acquire knowledge. To you, the older students, I have to endeavour to address my remarks in such a manner as to encourage you to still labour in the work already begun; to attempt to convince you that renewed application is necessary, and that nothing short of close study and industrious perseverance will suffice to properly qualify you to meet the world with that confidence in your professional acquirements which alone is calculated to ensure success.

The course of education, as laid out for you, consists of instructions upon chemistry, materia medica, anatomy, physiology, and the pathology of the horse, the ox, and other domesticated animals; and, although by some it may be thought that efficiency in one branch is of much greater importance than in another, it may, nevertheless, be affirmed that an intimate acquaintance with each and all of them is absolutely necessary. If the veterinary surgeon is to take the status so much to be desired, and which he has a right to assume, the outer world must be impressed with the conviction that he is a man whose knowledge is based upon scientific principles. Whatever else may be considered important, the absolute necessity for this qualification is a fact admitting of no question; and if this be so, no branch of the curriculum named to you, no stone of the foundation, must be thought of little import.

Let me briefly consider this curriculum, and the opportunities you will have of studying its divisions. By the aid of chemistry it is that we gain a knowledge of every constituent of the animal body, the composition, characteristics, and normal or abnormal condition of the various secretions and excretions; and by its laws we are enabled to institute investigations of these matters with a confidence of arriving at correct results. Our acquaintance with chemistry, moreover, enables us to understand the composition of our drugs; and knowing this, so to mix them as to ensure their action, or, in other words, without their being incompatible.

Materia medica teaches the quality, correct doses, nature

and mode of action of those substances or medicines which we have recourse to for the purpose of restoring health when it is impaired by disease.

I have frequently heard students complain of the difficulty experienced by them in acquiring a knowledge of these branches of science, chemistry and materia medica. They may, perhaps, require at the onset a little more mental application than either the study of anatomy or physiology, but be not disheartened, work at them a little closer, and you will find that the mist, which appears at first to surround them, will gradually clear off, and as they are subjects replete with interest, an insight into some of their mysteries will create in you a desire for a better acquaintance with all of them. You will have for your pioneer here one who will use every endeavour to facilitate your progress—I allude to Professor Tuson.

In speaking to you of the next divisions, viz. anatomy and physiology, little will suffice, I think, to render apparent their great significance as portions of the basement upon which rest much of the superstructure of our profession. By the researches that have been made in that division of anatomy designated general, not only are we made acquainted with the particular structure of every member or portion of a member of an animal, but much light has been thrown upon physiology; indeed, in very many instances it is impossible to perfectly understand the function of parts, or the manner in which such function is performed, without previously being acquainted to some extent with their general anatomy. The descriptive branch of anatomy, too, claims your careful attention. I am unaware of any class of practice which the veterinary surgeon has to give heed to, in which a knowledge of this section of anatomy is not required. That the practitioner, after leaving College, too often neglects his anatomical knowledge, and allows it to pass from him unobserved, as it were, I am sorry to say must be acknowledged to be a fact; but be assured that the value of such a person's opinion in almost every critical case is diminished in proportion to his neglect of this fundamental branch of his medical education. In diagnosing cases of visceral disease, in detecting causes giving rise to defective action (and how frequently are we called upon to display our judgment by determining the seat of lameness), in performing all kinds of surgical operations, in determining the course to adopt in cases of accidents, and in many other instances, success depends, to no slight extent, upon a sound and practical knowledge of anatomy; by which I mean not such an acquaintance as may be gained by reading books, or listening

to lectures, but by a personal application of the means which you must avail yourselves of to guide you in your own research. A verbal or written description of a town, a street, or a building, may give some idea of the appearance presented by either, or it may assist in enabling a person to subsequently recognise the object; but how very far short would this fall of the information which would be obtained by a single glance at it. No; I allude to such a knowledge of the subject of anatomy which alone can be acquired by careful and repeated dissection. You must work with your scalpel and forceps, until you can call to mind the arrangement of any particular part as distinctly as you can the features of an old acquaintance in his absence; then, and not till then, will you readily and confidently form correct opinions of the various cases of organic lesion which will hereafter come under your notice.

Physiology I am sure will secure your careful consideration, so interesting is its contemplation. By it we are enabled to account for the wonderful phenomena which take place in connection with animal life. Every muscle, tendon, and ligament, every blood-vessel, nerve, and absorbent, aye, every fibre, has its function to perform,—"For power hath made nothing which economy saw not needful." It is physiological research which informs us of these functions, and how the several structures are enabled to perform them as well as of the manner in which the support of the body is maintained, and effete materials removed. This study is also as important as it is interesting, for it is the first step towards the cure of disease. It has been said that pathology is the physiology of disease, and I think it palpable that, unless our views are correct with reference to function, we shall be in error in our pathological theories. This may be illustrated in the cause, which in numerous instances is productive of "roaring" and "whistling" in the horse. If we were unacquainted with the function of the inferior laryngeal nerve, how could we correctly account for the paralysis of certain of the muscles of the larynx, giving rise to an impediment to respiration? Our capability also to recognise disease of the heart entirely rests on a correct knowledge of the physiology of the organ. Again, the facts which we are in possession of respecting the sympathy existing between the stomach and the brain will enable us to account for, and to treat successfully, cases of cerebral disturbance. Numbers of other instances might be mentioned were further proof necessary. It will be my duty, and always my pleasure, to endeavour to remove difficulties which, perchance, may interfere with your progress in the pursuit of anatomical and physiological knowledge. Before

quitting this part of my subject, I have to acquaint you that, owing to a most unfortunate and melancholy accident, the late Mr. O. W. G. Brown, who held the office of Demonstrator of Anatomy in the College, was removed from among us towards the latter part of last session, and that his place is now filled by Mr. J. W. Axe, who, if we may judge from our previous observance of him, will perform the duties of the office with that ability, assiduity, and zeal that cannot fail to secure your respect and esteem.

The branch of study which forms the remaining section of your instruction, that I have yet to speak of, is pathology. I use this word in its literal sense—the doctrine of disease: it is this that teaches us the numerous and varied derangements of function and structure of the living animal which constitute a deviation from health. By it we ascertain the symptoms indicative and diagnostic of a general or ordinary malady affecting any particular organ of the body, or of a distinct affection of that organ; and in this way also we are enabled to discriminate between diseases that may to a considerable extent resemble each other—this is diagnosis. Pathology, likewise, enables us to determine the causes, both predisposing and exciting, which give rise to disease, and to foretell its probable termination. A knowledge of its principles will assist us in indicating the means of cure, and also to understand the action of those remedies which we may deem advisable to select in the different stages of a malady. In pursuing this branch of science, it is most important that you should be well acquainted with the natural habits of the animal when in health, as it is next to impossible to recognise symptoms of disease without being well acquainted with the indications of health. The importance of being able to recognise the symptoms of a special disease I cannot better impress upon you, perhaps, than by reminding you that our patients have no other means of informing us of their ailments than by the exhibition of phenomena designated symptoms. I feel it my duty to dwell upon this point a moment, and to endeavour to impress upon you the necessity for a close observance of the various cases of disease which will come under your notice during your period of study. I have many times heard veterinary surgeons regret their neglect of an observance of the practice of the College during their pupilage, and assert how different they would act had they that time to spend again. Let me, then, exhort you to regularly attend the clinical instructions which will be given daily, and not even to rest satisfied with this, but to carefully observe for yourselves the changes which take place, either in the advance of an

attack of disease, or in its yielding to the remedies employed. Always exercise due care in forming a diagnosis, however simple the case may at first appear to be, for, depend upon it, there is something to be gained from every case. I do not mean by this, that every case is attended with a similar amount of difficulty in treating it, nor do I wish in the slightest degree to underrate past experience; on the contrary, I believe repeated observations to be best calculated to bring about efficiency. For these reasons I would warn you, however great your skill or magnificent your accomplishments, never to undertake a case carelessly. Either give your patient the best of your skill and attention, or shun the case entirely, for be assured that mistakes arising from haste, or a want of exercising a proper amount of care and attention, admit of no excuse; nor can I too strongly recommend you to carefully examine all cases in which disease has terminated fatally, or in which it has been thought advisable to have the animal destroyed on account of the disease being incurable. By the observance of such a rule valuable information can alone be obtained; in proof of this, I could advance many arguments, but when I say that the experience which we have in this manner previously gained will enable us, in many instances, to speak with confidence of the duration of disease—knowledge which in our profession is frequently most valuable—I think I shall have said sufficient to convince you of the importance of your instituting careful *post-mortem* examinations. From day to day you will have an opportunity of listening to the lectures delivered by Professor Spooner on the Pathology of the Horse, who will also, on particular occasions, bring under your notice matters of importance in connection with the subject of Veterinary Jurisprudence. Professor Simonds will also lecture to you on the diseases affecting other domesticated animals.

In directing your attention to the different branches of study, I have said nothing of text books. I have, indeed, purposely avoided doing this, as I am of opinion that it should be left to each teacher to advise the class as to the books to be studied in relation to his own particular subject. I would, however, recommend you all to become members of the Veterinary Medical Association. This Society possesses a large and valuable circulating library, and its members meet each week during the session, for the discussion of scientific subjects.

Having thus given you an outline of the journey on which you have started this morning, allow me to give expression to a few suggestions, the remembrance of which may per-

chance enable you to accomplish it with a little more ease. Gentlemen, you will sadly neglect your own interests if you do not to your utmost take advantage of the verbal instruction which will be given by your several teachers; lose no chance, then, of adding to the information already possessed by you; listen carefully to every lecture, and, as many of you as are able, take notes of each, so that when at home you may be enabled to commit to paper the information which your teacher has endeavoured to impart. I know that to take notes is a matter of much difficulty to some students, and that while trying to do this portions of the lecture often escape their notice. Under circumstances such as these, careful attention will prove far more useful than the attempt to reduce to writing the remarks of the teacher. Some of you, doubtless, have a much greater capability of quickly acquiring knowledge than others, and will, consequently, experience less difficulty in attempting the mastery of the task laid out for you. To such I would, however, say, presume not too much on your quickness of perception, retentiveness of memory, great wit, or any other rare ability which you may possess, or perchance you will find that, instead of these being an advantage to you, they will lead you into habits of procrastination. However good or rare a person's talents may be, if he abandons reading and investigation he will grow old in ignorance. You must "read, mark, learn, and inwardly digest," to become learned or wise. A fatal error which some students commit, is that of treating their studies lukewarmly during their first session, flattering themselves that the second session will afford time enough to prepare for their examination. This is a quicksand which you must avoid. Depend upon it you would not be required to spend two sessions at College if one were enough, and, believe me, every day of the prescribed time is of precious value. If any one of last year's pupils has unfortunately thus erred, let me urge him not to brood over the misfortune—that is useless. Let him rather seek to make amends by a double application of his energies during the time which yet remains, and thus, as much as may be, surmount the ill-effects of his mistake.

> "To mourn a mischief that is past and gone,
> Is the next way to draw new mischief on."

It may be that my remarks have tended to awaken within some of you feelings of doubt as to your ultimate success; or, indeed, it may be that some may be impressed with the notion

that an acquirement of a scientific knowledge of the profession is more than their abilities will admit of their attaining. To such I would say, take courage and be not too impatient; select the groundwork of your subject, undertake a small portion at a time, and clearly understand this before proceeding farther: avoid, in fact, the investigation of all abstruse subjects until some advance has been made in your knowledge of simple ones. Knowledge is not to be obtained by striking into its depths, any more than a child can be expected to run before it has learned to walk. By taking gentle and regular steps, even perplexing subjects may be surmounted with ease. I would recommend you to set aside certain hours for private study, taking care that they are as strictly observed as the appointed times for attending lectures. Do not, however, apply yourselves so closely at one time as to induce weariness, for the brain needs rest as much as any other portion of the body. Let each branch of study receive its due consideration; to make a pet of one division, will only tend to prejudice your ideas of others, and to limit your general knowledge. Let there be a unanimous desire amongst you to assist each other; a free communication of ideas can have but one effect. Remember that the richest in intellect may learn from the poorest. I would further advise you to select but few intimate associates, and to take care that you choose only those whose friendship will be attended with mutual benefit. A true friend is "a jewel worth a world of pains, a jewel seldom seen." By all means, however, observe a feeling of goodwill and urbanity towards every one, and rather than sneer at any weakness on the part of a fellow-pupil, endeavour so to urge him in the right direction as to avoid giving him offence. Rather than step aside to point out a fault, endeavour by gentle efforts to wean him from it. It is unkind to impose unpleasant truth, even when an apparent necessity for it exists.

I trust that what I have this morning advanced may prove sufficient, not only to excite in you a greater interest than that which you already possess in the profession which you have selected, but that each one of you will determine to do his utmost to arrive at that proficiency which alone can earn for him a conscientious feeling that he has done his duty. Never lose sight of the goal to be reached, and, when strong temptations would baffle your best intentions, reflect for a moment on those who, with hopeful anxiety, are looking forward to the result of your College career. Think of the smiles and congratulations which will welcome your success, and of the disappointment which must attend your failure.

I cannot conclude without alluding to the presence here to-day of many of the elder and time-honoured members of our profession. I thank them much for the honour thus conferred, and I thank them the more because they enable me to say to you, who are students, "Go ye and do likewise."

A FATAL DISEASE AMONG HORSES IN INDIA.

By Thos. Richardson, V.S., 16th Lancers, Bangalore, Madras Presidency.

Will you pardon my thus trespassing on your very valuable time? But as I am at a loss to understand the pathology of a disease which has fatally attacked (since the 2nd of March) the troop horses at this station, and knowing what an interest you take in the advancement of the profession, I thought you would not mind assisting to unravel what to me is a web without a clue.

Symptoms.—The animals are off their feed, dull looking, and show great debility, which suddenly comes on; pulse 70 and small, grinding teeth, in some cases giddiness (animal raising head and running back in a staggering manner), curling upper lip, breathing laboured, the least exertion much increasing it, sometimes slight abdominal pain, at other times lying down quietly at intervals at full length with neck stretched out, in other cases standing persistently resting first one leg and then the other; mucous membrane of eyes and mouth injected and yellow, parts of buccal membrane sometimes being raised up like yellow bladders, mouth offensive from the first, extremities drawn, some fever present; fæces passed in small quantities, dark coloured and offensive, either soft or hard and coated with mucus, at other times none are passed; urine always scanty and dark coloured; in some cases there is immense tumefaction from lower jaw to sternum. As the case goes on, pulse gets smaller, quicker and less perceptible, breathing becomes more laboured and hurried, the countenance gets very anxious, and extremities cold, the animal sweats, sighs and gets down to die; average duration of the malady thirty-two hours; shortest period six, seven and eleven hours; longest fifty-four, fifty-seven and sixty hours.

Treatment has been tried as suggested by most of the

veterinary surgeons in this Presidency, but unavailingly. We have looked upon it as a blood disease, together with diseased glands and digestive organs.

Post-mortem examination.—Animals are generally fat inside, that is, they have a good lot of fat lining the abdomen; abdomen full of dark straw-coloured fluid; glands along ridge of colon blackened with lumps of yellow jelly-like material all about them (albuminous effusion?), the same being effused in large quantities under outer coat of colon and cæcum; kidneys surrounded with masses of the same effused material, which when cut into with a knife look more like the inside of a ripe greengage than anything else; glands of mesentery highly congested and blackened, especially near to the spine; masses of the same material effused about pancreas (which, by the way, is darker coloured than normal) and duodenum; omentum broken up, mucous membrane of colon invariably reddened, also that of the rectum, cæcum and small intestines in patches; bile exists always in quantity in the anterior part of small intestines, fæces throughout intestines always offensive and in a pultaceous state; in some cases coats of colon easily torn and mucous membrane quite black; pyloric mucous membrane of stomach invariably reddened, and that organ contains at times undigested food, being occasionally so full as to look, when removed from the carcase, like a case of plenalvia. There is never any appreciable flatus in stomach or intestines; sometimes regurgitation of food takes place into the œsophagus, and I recollect in one case, where a solution of magnes. sulph. had been given, the animal rejected it through the nose in small quantities at intervals without apparently any spasmodic effort. The contents of the small intestines are always fluid, and generally also those of the cæcum. In the chest and also in the pericardial sac there is a large quantity of the same sort of fluid as in abdomen. The lungs in some cases are quite healthy, in others the yellow masses before spoken of are effused about trachea and bronchials between lungs. The heart, liver and spleen, are fairly healthy in aspect, but are easily broken up; the latter organ is sometimes pale, sometimes black. The trachea and larynx are surrounded with immense masses of the yellow effusion before mentioned, the larynx the same. The glands about parotid region, except the salivary, are congested and blackened; larynx highly congested, especially the epiglottis, and there is œdema glottidis. The fauces are also congested and sometimes extensively *ulcerated*. In one case there were masses of yellow effusion in the pelvis, sheath, and muscles of thighs,

and the animal before death passed dark, straw-coloured fluid per urethra. There is always a discharge, too, of the same character from the nose. When the lesions in the abdomen and chest are very marked, the neck and throat are not much affected, as a rule, yet I have seen both divisions of the body in cases equally implicated.

In one case, where bleeding was tried, the blood that oozed from a large orifice in the left jugular was more like tar than anything else.

Yellow (lymph?) clots have invariably been found in the large veins of the body after death, and the blood is very black and thick. There is a peculiarly offensive smell from the carcase after death, and the flesh appears very rotten. The disease has not been found to be infectious. If I have neglected to mention anything about this ailment which I think you would like to know, I will, if you will allow me, write to you again. Since writing this the malady has been recognised as similar to one which broke out at Loodiana, in Bengal, some years ago, which was very fatal, and was known afterwards as the Loodiana disease.

It has been an unusually wet season in Bangalore this year, and crops of grass have sprung up quickly and luxuriantly one after the other, as fast as the harvesters could remove them. There are two monsoons or rainy seasons here, one of which is just over and has been an unusually long and severe one, and another is just setting in. The first three months of this year were unusually hot and dry, and the forage then was of a bad and fibrous description. The water used for the horse-shed is not good, being highly charged with organic material, but is, as far as I know, about the same as they have been drinking for years past. The grain they eat (Madras grain) is boiled, and is of the best procurable quality as far as I can tell, and is given to the horses in the same proportions and state as it has been used for years past. Instead of hay, the troop horses have grass cut daily and dried as much as possible before being given. The drying is difficult in the wet weather. The stable management is the same, and the horses are worked the same as they have always been in this station, yet the disease has not been seen before by people who have been in Bangalore for the last twenty years. About 420 of the troop horses are in stabling, and about 380 stand picketed out in the open. There have been just as many cases among the stabled as among the exposed, with the exception of one field battery picketed out, in which the casualties have been and continue to be very heavy. All the troop horses are on

high and well-drained ground. There have been only two cases among the officers' horses as yet. They most of them drink well water, I believe, which, of course, is to a certain extent naturally filtered, and they, perhaps, as a rule, get more work than the troopers; in other respects they are similarly treated.

If you will kindly favour me with a line at your convenience, or even through the *Veterinarian*, if more convenient to you, suggesting anything preventive or curative, I shall feel myself much indebted to you.

To me this epizootic is quite new, and I consider it most interesting to veterinary surgeons who have not seen it. If at any time I can be of service to you in communicating anything professional from this country, or answering any questions relative to professional matters in this part of the world, I shall be very glad to do so to the best of my ability.

[After a perusal of Mr. Richardson's interesting account of what he by implication terms the Loodiana disease, we felt bound to publish his letter for the benefit of the profession. The malady which he describes might be designated blood poisoning. If there is not actual death of the blood, its vitality must be seriously impaired. Without the aid of a minute investigation of all the circumstances in the locality, it is scarcely possible to form an opinion as to the true pathology and etiology of the malady. We are strongly inclined, most of all, to suspect the water. Perhaps if further inquiry were made, some new source of contamination may be discovered; probably the food and water may be both at fault. One general statement is all we can positively assert, viz. that the laws of hygiene must have been in some way infringed to bring about such results.

A few years since we were consulted with regard to a fatal disease among horses in Kent. The mortality had long continued, and the origin of the malady had not been discovered at the time our advice was sought. All the horses attacked were in good condition and apparently free from disease up to the moment of their giving indications of the virulent affection. The symptoms were, first, swelling of the sheath, gradually extending along the abdomen, abdominal pain, prostration, followed by death. The *post-mortem* examination revealed no organic lesions, but there was always effusion into the serous cavities, the blood was fluid and nearly black in colour. Upon inquiry the only cause that was found to account for the fatality was the impure water

of a pond from which the animals drank. The pond received the drainage from the straw-yard, and was impregnated with organic matter. Means were taken to prevent the animals having access to the pond for the future, and a supply of good water being obtained, the disease at once ceased.

By way of remedy, it occurs to us to suggest more exercise, as far as may be possible change of diet and water, and in any case the constant use of hyposulphite of soda in the drink-water in the proportion of one ounce of the salt to every four gallons of the fluid.

Referring to Mr. Richardson's last paragraph, we shall at all times be glad to have the advantage of hearing from our distant friends of matters which cannot but be interesting and instructive to us at home.—Eds.]

THE PRINCIPLES OF BOTANY.

By Professor Buckman, F.L.S., F.G.S., &c. &c.

(*Continued from p.* 755.)

In our remarks on the stems of exogenous or dicotyledonous plants are passed in review some of the giants of the forest, the great bulk of which are either indigenous to, or naturalised in, our own county, plants so long lived as to have witnessed most of the changes which have taken place within, if not before, the period of authentic history. But it is not only these larger specimens which belong to the exogenous group, but many of our herbaceous or annual plants also, which, though not possessing woody stems, have still the same arrangement of separable bark, woody fibre, and cellular tissue, or pith-cells.

These, however, are distinguished by accompanying characters to be observed in the foliage and in the seed; thus, the leaves of exogens are always net-veined, and their venation always forms flowing lines, whereas in endogens the lines are all straight, and their smaller divisions are made at right angles, as may be seen in the garden lily, but still more distinctly in the pond weeds. Another important distinction will be found in the seeds, which in exogens are always in two pieces; this may be illustrated by the common pea, which,

deprived of its testa, separates into two pieces or *cotyledons*, and hence the term di-cotyledons as applied to exogens. What, then, is called a "split pea," is, in reality, not so split by mechanical means, but its valves are made to separate at their natural line of division.

The fruit of the oak—acorns; of the beech—beech-mast; of the chestnut, and others, are examples of this structure of seed, and it is the thick arrangement of cells filled with starchy matter, all prepared as pabulum for the seedling plant, until it has developed its own proper roots and leaves, that renders these seeds in beans, peas, beech-mast, acorns, chestnuts, &c., so nutritious a food for animals. In monocotyledons or endogens we have not this division of seed into two valves, and hence we cannot split the various kinds of grain, but it is crushed, bruised, or ground, and so best employed in the shape of flour.

Exogens.—In Exogens or Monocotyledons we shall find that, unlike Endogens, all the most magnificent examples are absent, as either native or naturalised examples, in Europe, though they are occasionally met with in our hothouses. Still, we have in this country members of one important family in the class, which are in no part of the world more varied or more useful. Our native grasses are here alluded to; they are the staple of our meadows and pastures; and though they are for the most part but lowly herbs, yet in their aggregations in our pasture they may well be considered as equal in importance to the more imposing palms of the tropics.

No less important will be found the higher division of this group, which, forming our cereal grasses, such as wheat, barley, oats, and rye, or the more foreign group of maize, torghams, and millets, are all well known as yielding valuable feeding seed both for man and the lower animals. These it is of consequence that all who have to do with health and disease should accurately study, not only as to their botany, but also their chemistry, which is not less important.

Then, again, these may be grown in a healthy or diseased state, in both of which they exercise a marked influence on the constitutions of the creatures destined to feed upon them.

If we examine the structure of these endogens and compare them with exogens, we shall find a marked difference in structure; for although there are cases where in this respect they approach near to each other, seeing that nature has no hard lines of demarcation, yet a review of the broad phases of demarcation will be sufficient for our present purpose.

Be it remembered, then, that exogens, as the name implies,

increase from without by new layers of wood; thus, in the accompanying cut (Fig. 1) let the central column be pith; the next columns represent wood of the first and second years

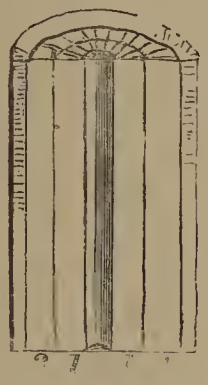

Fig. 1.—Stem of ash two years old.

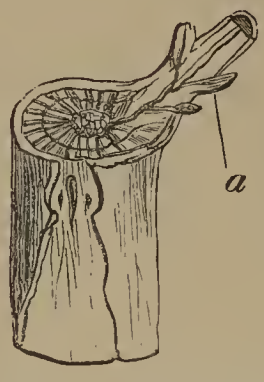

Fig. 2.—Stem of ash with a yearling branch.

Fig. 3.—Portion of the flower stem of a water lily.

respectively of the two-year-old stem; here the bark, wood, and pith are clearly separable.

Our next figure (2), shows a two-year-old stem, with a branch (*a*) of the year in connection with the outer layer of wood and buds, a preparing for the next season.

The next cut (fig. 3) shows the difference in endogens. Here is no separable pith, the smaller cells show a diffused mass of cellular tissue. The thickened masses at *a* are bundles of woody and vascular tissue, whilst the layer opening at *b* is an air space, to enable the structure to rise more readily in the water.

Thus, as Professor Lindley remarked—"In endogenous plants the vascular and cellular systems are as distinct as in exogenous, but they are differently arranged. The cellular system, instead of being distinguishable into pith, bark, and medullary rays, as a uniform mass, in which the vascular system lies imbedded in the form of thick fibres, seldom having any tendency to collect into zones or wedges resembling wood, the fibrous bundles consist of woody tissue enclosing spiral or other vessels."

The mass of an older endogenous stem increases by the secretion of woody tissue from the centre; hence, then, the middle of such stem is the newest and softest matter, and the exterior, instead of being soft wood, becomes hard by the pressure outwards, and, therefore, as stated by the author just quoted, in endogenous plants that obtain a considerable age, such as many palms, this operation goes on till the outside becomes sometimes hard enough to resist the blow of a hatchet.

Mohl and others differ from these views principally on account of some technical difficulties arising from the fact before stated, that there are cases in which it is difficult to distinguish endogens from exogens, but the principles laid down are sufficiently distinct for our present purpose, and it will hereafter be seen how clearly they will aid us in the subject of classification.

Acrogens. — In Acrogens or Acotyledons, we have an arrangement similar to that in Exogens—its wood forms an irregular ring of different sizes, masses of vascular and woody tissue arranged towards the circumference, as seen in the stem here called the rachis of the tree fern, but its great internal mass is cellular tissue unmixed. Stems of ferns do not increase much in circumference, but are added to by new cones at the apex; they do not possess lateral buds. They are usually hollow in age from rupture or absorption of the cellular tissue.

In these the leaves, usually called *fronds,* the stem of which is a *stipe,* are fork-veined, that is, the venation *bifurcates* at given points, first making larger and then in succession smaller and smaller bifurcations.

Thallogens.—In these the *thallus* or crust which supports the fructification is wholly cellular in structure, and has no woody fibre whatever, and they are devoid of true leaves, so that in them we have necessarily a lower type of plant than those previously mentioned.

The purpose of the stems of flowering plants is to produce leaves and flowers, going on to seeds, which latter are called the *appendices of* the *axis,* in thallogens, to form a crust which is the nidus of *spores,* or these may be elevated in a separable *stipe.*

Of course, in the larger and older trees the uses of the woody portions of stems will be well understood. In these sometimes the wood, as that of the logwood, the red heart-wood or duramen of which contains the active principle, whether for medicine or the arts. The Bitter-wood or Quassia is another example of powerful principles being found in wood, whilst such barks as that of the bitter willow, cinchona, and oak, among others, will serve to show how varied are the qualities of the different parts of stems, however easy it may be to refer them to one uniform type of structure.

(*To be continued.*)

OBSERVATIONS ON IMPACTED BOWEL IN THE HORSE.

By W. Ernes, M.R.C.V.S., Dockhead.

This affection does not often occur, but when it does it is generally fatal.

Symptoms.—These, in the majority of cases, are those of colic; the animal lies down frequently, but rather carefully, and does not roll about as in violent colic. If in a loose stall he walks about, switches his tail, paws and looks at his flanks, the pulse is but slightly increased, the respiration almost normal, the mucous membrane slightly tinted with dirty yellow; in the nostrils it is dry, the mouth is hot, the tongue coated, there are frequent attempts at staling, but very little urine is voided, and that is of a dark colour; the penis remains partly drawn, and is flabby. The rectum and the bladder, if explored, are found empty, likewise the floating part of the single colon, the doubling of which can be easily felt through the rectum. The appetite is completely lost; if water is left within reach, the patient will often slobber in it, but swallows very little of it. In some cases the symptoms of colic are totally absent. The animal is somewhat dull, refuses his food, drinks little, and the general symptoms do not lead to an accurate diagnosis. On the inquiry as to the bowels acting, the answer is sometimes, that no dung has been seen; the case now becomes more clear. It goes on from hour to hour, and from day to day, without either improvement, or very great aggravation of the symptoms; the colicky pains, when present, having subsided, until the third or fourth day, when the animal becomes a great deal worse and dies about the fifth day, frequently without a struggle.

Treatment.—From this little can be expected; you can pour drugs into the stomach, but you cannot make them act. I have known a large quantity of opium given to allay the pain without producing the slightest visible effect; but as something must be done, the treatment should be first directed to remove the colicky pains, afterwards laxatives should be prescribed. Strong purgatives are contra-indicated, as they would aggravate the evil by forcing the ingesta against the obstruction, or even cause a rupture of the intestines. This method, with enemas which seldom do good, as they come away without much staining, is about the treatment to be adopted.

Post-mortem.—The body is enormously distended with gas.

On making the section into the abdomen the stomach is found distended with gas and water, little or no aliment; the medicines which have been administered might be traced in this fluid mass; the small intestines are devoid of aliments, but more or less distended with gas. The cœcum is much distended with gas and a fluid mass, in which a few débris of aliment are seen; the cœcal portion of the colon is similarly distended, but the ingesta is more solid; this becomes more so as we advance, until we reach that portion of the colon which is considered as the second stomach, which is found enormously distended with a hard dry mass of badly masticated and ill-digested aliments. This is the obstructed part, but we look in vain for any mechanical cause, none is found. The opening into the single colon is wedged with ingesta, and beyond it the single colon is found empty.

Obstructions when caused.—Calculi are generally found in the latter portion of the intestines. The coats of the large intestines are hyperæmic throughout, and can be easily torn.

Causes.—It is difficult to assign any with certainty. It has occurred when horses had not been out of the stable, and in others while at work; in the former it has been attributed to over-feeding, and in the latter to straining under heavy loads. In my opinion this system of manger-feeding has much to do with it; in those cases where I have made the *post-mortem* examination, I have traced the chaff as it came from the cutting-machine having undergone little or no mastication. It would be interesting to ascertain whether the disease prevailed to the same extent before the system of manger-feeding was introduced. Over-feeding and hard pulling, by lessening the peristaltic action of the intestines, would no doubt contribute to the obstruction.

We have recently had two cases of ruptured stomach in the horse in less than three weeks; both cases were far advanced before they came under our notice, we were consequently unable to observe the early symptoms. Query? Are they to be attributed to the same causes?

THE APPLICATION OF CARBOLIC ACID TO ANIMALS.

By the Same.

A WELL-BRED carriage horse was brought to our infirmary on the 2nd of September, with a deeply lacerated wound on the lower third of the neck, caused by the end of a broken shaft in an accident. The wound was above ten inches in

length, and in some parts two inches deep: it nearly divided the levator humeri and the sterno-maxillaris muscles, escaping jugular vein and carotid artery, which at that part are deep seated. The wound was stitched up and dressed with a saturated lotion of carbolic acid daily. Suppuration set in about the second day, but was never very abundant. The wound healed very fast, and on the 23rd of September the patient was discharged.

The great advantage of the application of carbolic acid in this case seems to have been the speedy healing and the checking of inordinate suppuration, which at no period of the treatment ran down the neck, deluging the hair, &c., as is the case with extensive wounds.

PARACENTESIS ABDOMINALIS.

By the Same.

A HORSE was brought to our infirmary suffering from flatulent colic, which the usual remedies did not relieve. The abdomen became greatly distended with gas, there was evidently an obstruction which greatly endangered the life of the animal, and nothing but an operation could have saved it: this was at once decided upon. The animal was held and partly supported by two men, and the trocar was plunged into the right iliac region. The gas escaped with great noise, and five minutes after the patient was looking for food in the litter. No complication ensued, and the horse, belonging to a poor person, was discharged on the second day after his admission, with orders to be brought back if anything further occurred.

A few years ago a light cart mare was brought to our infirmary in the morning suffering with colic. She was attended all day but without any change in the symptoms, no defæcation took place; there was evidently some obstruction. Tympanitis set in towards the latter part of the day, increased during the evening to such an extent that the life of the animal was in danger. The operation of paracentesis was decided upon. The trocar was plunged into the right iliac region, a large quantity of gas escaped, and the patient was left for the night. The next morning all the unpleasant symptoms had disappeared, the mare was inclined for feeding. She was kept for some days in this infirmary, the wound closed, and she was put to her usual work.

The late Professor Brogniez, of the veterinary school of Brussels, had a very high opinion of this operation, and

would have had it resorted to in every protracted case of colic; he thought that the introduction of a metallic tube had something like a galvanic action on the bowels which restored the peristaltic motion, as he had noticed that defæcation almost invariably occurred after the introduction. He invented a tube which could be fixed in the intestine by means of two little hooks raised by a spring and tied on the outside by two silk strings; this prevented the intestine from receding after the gas had been liberated, and thus exposing the peritoneal cavity to the access of atmospheric air through the tube.

PRESUMED POISONOUS INFLUENCE OF ACORNS ON CATTLE.

By W. E. Litt, M.R.C.V.S., Shrewsbury.

Within the last month or so my attention has been called to several cases of disease amongst cattle in this neighbourhood of a peculiar type, in all of which acorns were alleged to be the exciting cause of the affection. The symptoms present were in every instance well marked, being principally excessive prostration and debility, total loss of appetite, breathing a little hurried, but unaccompanied with a grunt; pulse small and weak, but not unnaturally quick. Slight constipation existed at the commencement, which was soon succeeded by an irritable state of the bowels, the dung at first contained a few acorns nearly whole, and a good deal of acorn pulp. The skin and nose of the animal were dry and harsh, and the skin was tightly adherent to the ribs. The animals lay down most of the time, and gradually sank, death taking place in from two to five days. In no instance was abrasion of the buccal membrane to be detected, but both it and the membrane of the vagina were pallid.

The *post-mortem* examination threw but little light on the matter. The thoracic viscera were healthy, but the abdominal viscera were of a pale colour, and had a slightly shrunken appearance. The rumen generally contained a fair quantity of partially masticated food, grass, leaves, and acorns both whole and crushed. The contents of the other stomachs were perfectly natural in appearance, and also throughout the whole course of the alimentary canal, with nothing like impaction anywhere. All the animals which came under my notice had been grazing with other cattle in parks and places where acorns were abundant. These had evidently

been partaken of by both healthy and sick, as was shown by their dung.

With regard to treatment, some cases recovered under the exhibition of mild purgatives and stimulants, but many sank and died, no matter what treatment was adopted.

I do not suppose for a moment that the disease is the result of the existence of a poisonous principle in acorns. Indeed, in many of the healthiest animals, there was distinct evidence that they had made acorns their principal food.

It is desirable to look deeper than the mere surface for the cause of such a great fatality as this amongst the grazing stock in many parts of the country. It may, for instance, be suggested that some chemical change had taken place in the grass and herbage generally, in consequence of the powerful influence of night frosts at this season of the year, transforming the nutritive constituents of the grass into a deleterious agent.

As the subject is important, I should like to hear the opinion of many of my professional brethren, whose greater experience may enable them to throw some new light on the matter.

FATALITY AMONG YOUNG STOCK.

By "Con."

In the last number of the *Veterinarian* a short though interesting account was given of some cattle in Essex having fallen a prey to the effects of eating too largely of acorns. Great numbers of young stock have been lost in various parts of the country, principally cattle under eighteen months old, although older ones have in some instances suffered, and, to my knowledge, in one or two cases older animals have been lost. The cases which I have been called to presented symptoms which nearly resembled those of cattle plague; with one or two exceptions, they were as follows: the animals were first observed to be dull and dispirited, the bowels were generally constipated, and in some instances diarrhœa of a most offensive character existed. This state of things lasted a day or so before any other symptom manifested itself; the next thing, the animal is seen apart from the rest, rumination is suspended, there is dropping of the ears, and deadly coldness of the surface, the eyes are sunken and glassy, a discharge takes place from the nose, the mouth is cold, and the breath of a most offensive character. The animals generally succumb to the disease about the third day, and in the cases which I have seen not

one has lived over the fifth. The *post-mortem* shows the rumen, omasum, and abomasum in places to be highly congested, especially the omasum; clots of blood were found between its folds, showing the vessels to have given way. The intestines were almost in a gangrenous condition and fast undergoing decomposition; the other viscera were healthy, with the exception of the heart, and on it were seen many ecchymose spots about the size of a pea.

I have been induced to send you this account, thinking it might be interesting to some who may not have had the opportunity of seeing cattle so affected.

VETERINARY EDUCATION.

By William Hunting, M.R.C.V.S., Mayfair.

The ventilating of the "Education Question" is already producing good results. From the various articles we can gather a number of opinions which tally with each other, and we also get direct proof often of the erroneous ideas and statements promulgated by others.

Surely, if a few more practitioners publish their views and experience we shall be able to cull from the lot something tangible suitable to all—at any rate, to all really interested in the advancement of our profession. Let us look over the opinions we have got, and first, of the "leaders" in the *Veterinarian*.—The staff of our monthly organ is composed of men who have all had large experience in the teaching of students, who know well the aptitude and short-comings of the men, and who have an extensive personal knowledge of practitioners; who have, in fact, all that is requisite for forming a just and true estimate of the requirements of men about to enter the profession. What do they tell us? That a higher standard of general education is necessary, and that this extra refinement, instead of being a detriment, would be an invaluable help. As regards the technical education, the "leader" for October says decidedly that a man should first learn the principles, and then endeavour to put them into practice, and that if this arrangement be followed out properly, they will be mistaken "if the most assiduous worker in the dissecting room and laboratory, the most attentive listener in the lecture room, and the most finished scholar of the class, is not also the most laborious worker in the infirmary, and ultimately the best operator and the cleverest practitioner." Now let us see what Mr. Greaves says on the subject. I quote his words: "I would say, let

the youth intended for the veterinary profession be taught to write a good, legible business hand; be taught English grammar thoroughly, English composition, English history, arithmetic, mathematics, natural history, geography, French and Latin." This sentence saves us the trouble of repeating a good deal of what Mr. Greaves has said regarding education; for I feel sure no one ever wished for more, and few expected so much as he has here suggested; of course, Mr. Greaves would not be satisfied of the youth's proficiency without a test.

I take one exception to the above quotation: it implies that the youth is intended for the profession previous to receiving his education. So utterly unreasonable is this idea, that I cannot believe it to be Mr. Greaves' meaning. It is self-evident that we ought not to plan a course of general education specially for the profession. *Special* scholastic teaching can have but one effect—to cramp and narrow the mind.

All we want is, such a test of the student's general knowledge as shall guarantee his ability to properly understand and appreciate the requisite technical information, and as shall enable him to take such a status in society as we now long for—two events which at present are experienced by about 10 per cent. of us. We hold quite as good a position, and get quite as much remuneration as we as a body deserve. We wish to better both; let us then better ourselves and the public will respond.

Mr. Greaves, on technical education, is as illogical as he is liberal on the general question. He wishes men to practise that which they do not and cannot understand, and to bind themselves for a period of time to a man who, as likely as not, treats every case as his ancestors did, by mere routine and with stock formulæ. In other words, to be apprenticed for three years before going to college. Numbers of men practically support the apprenticeship system, but I fancy few would attempt to defend it by reason. Doubtless it is good to *have* an apprentice, but *to be* one is a very different affair.

To *have* an apprentice sometimes means the netting of so much cash; the having an unpaid servant to clean the surgery; make, dispense and administer medicines, run errands and collect accounts. No wonder a man keeps a pupil at this rate. *To be* an apprentice means paying so much cash, and learning to make balls and give draughts; in fact, to supersede the surgery boy or the groom. After two years of such drudgery, it is true he is allowed to visit patients, and even, I must say it, *treat* the victims. Truly this sort of practice

verifies Voltaire's sarcasm about "pouring substances of which we know little into bodies of which we know still less."

Is there any innocent parent who thinks his boy has the nature of every disease explained to him, the actions of the draughts, and value of symptoms told him? Deluded individual! in lots of cases the master is as wise as the pupil; so as a compensation he instils into the latter's mind questionable bits of tact, enjoins silence, and cultivates dissimulation.

This is the growing apprentice; now what is he like when fully developed and commencing at college? In the lecture room he is patronising, at operations conspicuous, where he criticises the operator and draws odious comparisons 'twixt him and "old so and so," his late teacher (?); at the debating society he is quite oracular, has always "seen a case," and if put in a corner by some well-read student, descends to "well, that may be very good in theory, but won't do in practice." He generally gets his diploma in two sessions—who cannot?—speaks lightly of its value, says the examination was "easy as could be," and then goes into practice.

Now here let us see what Mr. Greaves says of him: "In the performance of his duties he studies to make his ideas and disposition, his conduct and character to be in unison, so as to suit and harmonise with those of others by whom he is surrounded . . . . he cultivates a pleasant, agreeable, courteous and obliging manner." A slight alteration in a few of the words would give as correct an account of him. This, for instance: In the performance of his duties he studies more to treat the master than the patient, and regulates his ideas and manners so as to suit and harmonise with those of others by whom he is surrounded, be they grooms or tinkers . . . . he cultivates a plausible and self-satisfied manner, and is cringing or familiar as required.

In another place Mr. Greaves says "he drives straight to the stable yard, *his work, his duties, lie there,*" and, let me add, too often his tastes and inclinations.

From what I have said, I think it will be gleaned that I agree with Mr. Greaves in the matter of general education, but most sincerely deprecate the perpetuation of the apprenticeship system.

I do not wish to imply that sordid motives influence every one in taking pupils, or that all pupils are conceited bigots, but I do say my picture is as true as Mr. Greaves's—he coloured one side, I have coloured the other. Let an impartial man strike the balance, and I think my description will tally best with the actual fact. It may be said that the better educated class of men will be above all these defects—quite true; they

will also be above the menial work given to some pupils now, such as scale and counter cleaning, grooming horses, and polishing harness.

But to return to other men's opinions. The correspondent "Forfarshire," from personal experience, cordially confesses that he feels the want of a good education, and that he has "often been the victim of scientific perplexities." What a contrast to those held up by Mr. Greaves who are ignorant of a doubt, and whose ignorance is the sole cause of their confidence! "Forfarshire," I think, depreciates himself. I would rather have one friend like him than twenty who are never perplexed. "A Country Practitioner" is evidently an educated man, and his opinion is valuable as showing how such a one is treated. He tells us, too, of veritable "highly educated men who are painstaking and working practitioners," thus effectually disposing of the argument that education induces a false refinement.

Mr. Howell, a standard practitioner, considers that a student should just be taught principles, *and then* learn practice.

In the September number of the *Veterinarian* is published a paper by Mr. Walley, read before the Liverpool Veterinary Medical Association. It begins by saying that the one grand question is, "What profit am I to gain from this thing?"—this opinion would have looked better in disguise. The author next terrifies us by an awful account of education used improperly. Luckily, however, for the possessors of such a dangerous commodity, his instances are all of *want* of education. Next, we have a splendid programme laid out for the training of a youth; but it has one little objection, *i. e.* it is utterly impracticable. I conclude, however, from the tenor of the whole paper, that Mr. Walley is in favour of an educational test.

At the close of the paper the President expressed his belief that, if the apprenticeship system were done away with, the *respectability* of the profession would be swamped.

Mr. Greaves at his worst never even hinted that the want of a pupilage tended to make a man a blackguard.

To sum up, then, I think we may conclude that a large majority desire some public test of a student's possessing a decent education, and that the subjects given by Mr. Greaves, with slight modification, would be satisfactory.

I think, too, that the weight of testimony and reason inclines to the opinion that a student should attend college to learn principles and the animal structure before going into practice.

I conclude by hoping the length of my communication

will not prevent its insertion, and that its tone will not lead to misapprehension.

VETERINARY EDUCATION.

By "VIGILANT."

WILL you kindly permit me to make a few remarks on veterinary education? Many who write on the subject assume that a well-educated pupil will be above the drudgery and work necessary to the practice of his profession, and in conversation I have often heard the same assertion. On further inquiry I have usually found that the so-called highly educated failure has been some idle waif and stray who, after trying his hands and wits at almost everything without success, has taken up veterinary surgery as a last and, as he supposed, an easily obtained resource. No wonder, then, that he failed in a profession which, quite as much as any other, requires *application, thought,* and *tact.* The candidate for the diploma does not require the accomplishments of a senior wrangler; but he wants, at least, a good sound English education, with some knowledge of Latin, Greek, and French, all of which any youth of average capacity, of sixteen or seventeen, who has been at a decent school, should possess. If knowing *so little* will make him above his profession, he will be above working at anything else, which really means that he is a very lazy or frivolous fellow. This fear of over-educating the veterinary pupil I believe to be absurd and founded on false assumption, for do we not all know well-educated practitioners who are very successful, and who eagerly employ their spare time in general study? I could name many such, but for obvious reasons refrain from doing so. I have not, however, met with *any* veterinary surgeon who does not desire to see his profession take a better position. The human surgeon has more disagreeable operations to perform than the veterinary surgeon, yet education does not make him too fastidious to undertake them. Education expands the mind and reasoning powers, and so enables a man to leave the beaten track of routine with confidence. Knowledge every day commands more respect; and it is high time that the veterinary student should be able to employ anatomical and pathological terms without ridiculously misplacing and mutilating them, as is so often done. Of course, if a man is educated in general

knowledge, and ignorant of the profession he practises, he will be laughed at, but he would be equally so under the circumstances if too illiterate to write his own name. Why should a veterinary surgeon have a worse general education than the members of many trades which are all drudgery and routine? Among the number of young men who commence the study of veterinary surgery there are doubtless many failures, some because they have chosen the profession without consideration, some from thinking that because they are fond of horses they were born to be veterinary surgeons, others because the pupil or apprentice is too frequently allowed to have his own way. Respectability of language and conduct should be inculcated. The pupil, unless censured by his master for faults of behaviour, is very likely to contract loose habits, especially the fatal vice of tippling. He is, and I have frequently noticed this, often spoken to before grooms, &c., in a manner which, although it may make ignorant and vulgar bystanders laugh, is really degrading to teacher and pupil, and utterly subversive of the latter's self-respect. Servants *intuitively* see when a man respects himself, and like him all the better for doing so. If they are allowed to observe that the pupil is despised by his master or improperly addressed by him, what must they think? As to grooms, &c., it is easy to meet them properly and kindly in the way of business, and yet not be on terms of equality and familiarity with them, either then or during leisure time. He who does the latter soon becomes unfitted for higher society, with which he will have no community of feeling and ideas. No sensible man will seek the society of one who appears to prefer that of his servants. I believe that when veterinary surgeons, *as a body*, have become fitted by *education and character* to take a higher position, society will acknowledge the fact and welcome them as it now does many individuals, but in the mean time no amount of self-assertion will hasten this desirable result, towards which, however, very perceptible progress is being made. When it has been arrived at, veterinary surgeons will no longer be found to decry that knowledge and culture to which all who practise the profession should aspire, and gaining which, they will no longer be treated as if they were unworthy to receive ordinary civility, as appears too often to have been most undeservedly the dismal experience of some of your correspondents when attending serious and protracted cases. A man may affect to despise education, but cannot really do so, because he sees daily and hourly the power, comfort, and social advantages it confers.

THOUGHTS ON THE PRELIMINARY AND VETERINARY MEDICAL EDUCATION OF THE FUTURE VETERINARIAN.

By a "Vet." of '59.

I would preface my remarks by stating that the education of the young man who presents himself as a candidate for studentship cannot be too high, provided he is not afraid of foul smells or of soiling his fingers.

I believe that the apprenticeship system does not find favour with the existing schools, or with the majority of the profession. Believing this, I base none of my thoughts thereon.

It is admitted by the profession that the education of its members is not in a satisfactory state. That being admitted, brings me to the question, What can be done for the future "vet." with a view to the advancement of the profession?

1st. There should be a preliminary examination in arithmetic, carried to its highest limits short of mathematics, writing from dictation, grammar, geography, English and general history.

2nd. An extension of time for study is necessary, three sessions, and a summer session should be devoted to the acquirement of scientific knowledge. The session should commence at the beginning of October, and terminate the latter end of April. The summer session might commence at the beginning of May, and terminate the latter end of June.

3rd. The curriculum should be enlarged and extended by the addition of botany, practice and practical surgery.

The first two sessions should be devoted to anatomy, physiology, materia medica, and chemistry. An examination on those subjects should be instituted at the end of that period.

The summer session should be devoted to botany and the examination of horses as to soundness, the third session to practice and practical surgery. At the end of the latter period an examination should take place on botany, practice, and practical surgery. Of course this would involve greater expenses, but I am of opinion that the embryo "vet." would not object to five guineas being added to the existing fees.

I think that such a course of education as I have mapped out would give the profession the material needed, and go far to settle the much-vexed question.

Pathological Contributions.

DEATH OF CATTLE FROM EATING ACORNS.

(*Extract from 'Gardener's Chronicle.*)

We hear from Windsor that the use of acorns for cattle has not been attended with good results, several of the Herefords having been indisposed after partaking of them. In the neighbourhood of Watford several cases of illness have arisen from the same cause. Lord Ebury had ten heifers seriously ill, some of which died. They had been feeding greedily upon acorns, and became constipated; in two days diarrhœa and scouring set in, which it was impossible to stop; death soon afterwards occurred. Other cases had been noticed in different herds, and attended to when in the costive state, but no cases have recovered after the second stage had set in.

PHLEBITIS IN A CART MARE.

Reported by Mr. Thomas R. Scruby, Royston.

An aged cart mare was taken with colic on the 12th inst. I was sent for the 13th inst., when symptoms of enteritis appearing, I treated her for it by bleeding, &c. Next day she was better and feeding; on the following day she was still improving. On the 17th she slipped her foal (four months gone). This occurrence did not appear to have any effect on her health, and she continued to improve. 23rd, I was sent for again, when she was reported as continually walking round her box and looking at her side, pulse much accelerated, and she was tender over the walls of her chest. I could detect no respiratory murmur on auscultation, though the breathing was but little disturbed; gave an aperient, but did not bleed again, as the animal was weak from her previous attack; mustard with Liq. Ammon. Fort. was applied to her sides; ordered to be repeated and to be covered over with cloth above and sack underneath. 24th, about the same, but could not move her jaws, and there was a swelling of a hard nature over the parotid gland in the morning, which extended down the jugular vein; towards evening she could not raise her head to take her medicine, so I had recourse to fomentations and poultices; to-day the swelling much reduced, and

she can eat; a peck of wet bran with scalded oats was given to her this morning.

The vein on bleeding to all appearances healed by the first intention; how is it that the inflammation commenced at the region of the parotid gland, and not at the part where the operation of bleeding was performed?

SCROFULOUS DEPOSIT WITH EMPHYSEMA IN THE LUNGS OF A COW.

Mr. S. J. Rayment has sent the following history of a case of pulmonary disease in a cow.

On the 31st of last month another well-marked case of emphysema of lungs associated with scrofulous deposit came under my notice.

The subject was a young dairy cow which had been unwell some time. The owner informed me that he purchased her some six weeks previously for slaughter; but as she gave a considerable quantity of milk he had recourse to treatment, hoping she might recover; as, however, treatment was ineffectual, the cow was killed, and the post-mortem examination showed the carcase to be in a dropsical and emaciated condition.

The lungs were emphysematous and infiltrated with deposit, some of which were calcareous and some quite soft. Similar deposits had taken place in the mesenteric and other glands.

Mr. Page Wallis, M.R.C.V.S., Cambridge, has sent us a communication relating to the

SINGULAR DEATH OF TWO VALUABLE THREE-YEAR-OLD COLTS.

The animals were the property of Mr. James Graves, of Cottenham, near Cambridge, who, thinking that a little exercise would be beneficial to their health, let them out into a small field or paddock, where they commenced playing and galloping about. In their gambols they took opposite directions, and when in full gallop their heads came in contact with each other, and both were killed almost momentarily.

The *post-mortem* examination showed that one had fractured his neck and the other his back. The injury in the neck consisted of a fracture of the *dentata*, and laceration of

the ligaments, &c., and that of the back of a fracture of vertebral heads of the third, fourth and fifth ribs, with two of the bodies of the dorsal vertebræ.

SCAB IN SHEEP (SCABIES OVINA).

From communications which we have received it would appear that this disease is prevailing to an unusual extent in many districts. Several cases of litigation, arising out of the sale of diseased animals, are likely to come before the Courts, and already we have been consulted in two or three of such cases. Our readers should remember that, by an Act of George III, it was made penal to depasture sheep affected with scab in any open or unenclosed pasture land; and by the 30th and 31st Victoria, cap. 125, the penalty attaching to the exposure of cattle affected with plague in any fair or market was made to apply to sheep the subjects of scab.

MORBID DEPOSIT IN THE VAGINA OF A HEIFER.

The following exceptional case of disease occurring in a heifer is recorded by Mr. Thomas R. Scruby, Veterinary Surgeon, of Royston.

A heifer, just under three years of age, calved after nine hours of severe labour. The placenta came away in due course; and excepting that the animal appeared to be somewhat stiff in the hind quarters, no symptoms of disease were observed. The calf died three days after birth from diarrhœa. After the lapse of a fortnight, Mr. Scruby's attention was called to the heifer, and he found the animal straining violently and continuously; there was no discharge from the vagina, nor was the appetite impaired. An oleaginous purgative was administered, and orders were given that the heifer should be clothed and kept quiet. Next day, the straining still continuing, the vagina was examined, and on withdrawing the hand it was found to be covered with black fetid granular matter.

Narcotics were administered internally, and a lotion of tincture of opium with water was daily injected into the vagina. Under this treatment the straining ceased, and the heifer is reported to be doing well.

Facts and Observations.

The Cattle Plague Rate in Cheshire—A meeting of the members of the Cheshire Chamber of Agriculture was recently held at Crewe for the purpose of considering the question of the cattle plague rate in Cheshire. Lord de Tabley presided. The secretary (Mr. Rigby) read a report showing the position of Cheshire in reference to the repayment of the loan of £270,000 made to the county in 1866 by the Government to enable it to carry out the compensation clauses of the Cattle Diseases Act. On the 1st of November, 1869, the sum to be paid is £14,583 18*s.* 10*d.*: on the same date in 1870, £20,801 10*s.*; in 1871, £28,833 7*s.* 10*d.*; and on the 1st of November every year afterwards, £14,227 15*s.*, until the debt is extinguished, in 1896, in which year all the balance then due is to be paid. Upwards of 34 per cent. of the cattle in Cheshire had either died of the plague or been killed, representing a loss of at least £700,000 of capital and £50,000 of income as their average annual produce. It was, therefore, unjust to the county to subject it to the cattle plague rate for nearly thirty years, when the action it was compelled to pursue was clearly beneficial to the whole kingdom, and the loss so great to itself. After discussion, it was resolved that a copy of the report which had been read should be forwarded to the Central Chamber of Agriculture in London, and to the other chambers throughout the country, requesting them to join in a petition to parliament praying for a remission of the cattle plague rate in Cheshire.—*Standard.*

A Breeding Mule.—At a meeting of the Société Impériale d'Acclimatation, it was stated that a mule, twelve years old, had dropped a male colt at Mont-de-Marsan; it was born at the full period, and was perfectly formed. The dam gives milk, and the foal sucks, but the mother manifests a profound indifference for her offspring, and does not exhibit the slightest yearning when separated from it.—*Medical Times and Gazette.*

Sheep-washing in Australia.—The sheep-farmers in Australia have a shrewd eye for business. Some of the leading men among them have recently spent considerable sums of money in the construction of apparatus for sheep-washing with hot water. From water at a temperature of 110°, into which they are first plunged, the sheep are floated to a tank of cold water, where the cleansing is completed with

a kind of douche. So much grease is taken out of the fleeces by this process, that henceforth Yorkshire will be willing to give a better price for the wool.—*Athenæum.*

Price of Milk in China.—They are paying 7*s.* a gallon for milk at Hong Kong. It is some distance from the London cowsheds, certainly; but the information ought to excite some interest even here. Good cows are to be purchased at San Francisco, and they can be shipped more advantageously thence than from probably any other point. And a man with sufficient means, and well acquainted with the business of cow-keeping, who shall venture on the speculation we have thus suggested, will find that "while money makes money" all the world over, the maxim is expecially true in China, where it can be done viâ milk quite as satisfactorily as viâ tea. Meanwhile, Mr. Granville Sharp, who writes from 79, Strand, will be happy to give every assistance and any information desired to any one who is willing and able to go into the matter in a suitable way.—*Gardeners' Chronicle.*

Meat Preserving.—We have long known what is meant by competition with the foreign corn-grower, and from all accounts it will not be long before we have to cope with the colonial or foreign meat producer. The Melbourne papers have been enlarging upon the perfection of the process for preserving meat patented in this country by Messrs. Medlock and Bailey, London. This process is said to be simple. "There is no mystery about it," says the *Melbourne Argus* of July 18; "any housewife can preserve a leg of mutton in a couple of minutes, and it is as efficacious in the case of poultry and fish as with beef and mutton. Carcases of sheep or sides of beef may be cured whole or in the most minute portions." The whole secret consists in dipping the animal substance to be preserved into a solution of bisulphite of lime, and allowing it to remain there for about twenty minutes. One of the best recommendations to this process of preserving animal food is the innocuous character of the bisulphite of lime, the basis of the solution used. The Food Committee of the Society of Arts, which commends this process for domestic service, could not, however, confidently recommend it for long voyages or long periods of time.—*Gardeners' Chronicle.*

THE VETERINARIAN, NOVEMBER 1, 1868.

Ne quid falsi dicere audeat, ne quid veri non audeat.—CICERO.

INSPECTION OF HORSES AT THE ROYAL AGRICULTURAL SOCIETY'S SHOWS.

SOUNDNESS and unsoundness are terms which in application to the equine race are provocative of much dispute, not to say unlimited difference of opinion; nevertheless, it is admitted that there are certain well-known diseases and defects which are easily recognised and are always objectionable even if they do not incapacitate an animal from work, and it is usually by punctilious persons considered desirable that these defects should be detected and called by their proper names. A veterinary surgeon in his zeal for the interests of the individual who seeks his advice may prefer to overrate the importance of a splent or curb, or to entertain and express grave doubts about a joint or tendon, and altogether to spread dismay in the mind of the intending purchaser; but all this is consequent upon a somewhat loose system of interrogation which is permitted to the buyer of a new horse, who always appears to be apprehensive of a disastrous termination to the experiment. At agricultural shows much, if not all, of the difficulty attending a private examination is in the nature of the arrangement set aside; there are no interests to consult, the owners of the animals under examination are unknown to the inspector, and the Society is quite indifferent as to the result of the inquiry. In fact, assuming that fair time is allowed, and all necessary space provided, the examination of horses at agricultural exhibitions may be conducted under unusually favorable circumstances. If the animal is found to be free from defects which are likely to be transmitted to its offspring in the case of breeding stock, or to seriously lessen its usefulness as a hack, roadster, or hunter, it is passed sound, and takes its chance in competition before the judges. If, however, some radical defect is discovered sufficiently important to justify the step, the horse is disqualified, and his chance of a prize is gone; in short, commendation is given to those that are

without reproach, and censure is awarded to the pretender. Unconscious though the animal may be of praise or blame, nevertheless the effect was salutary, as the honour or the imputation passed from him insensibly to his owner. If we remember correctly, when veterinary inspection was first established by the Royal Agricultural Society, a very considerable proportion of the horses were found to be unsound; gradually the reflected stigma of disqualification made owners of animals more careful, and of late years the number of disqualifications has been comparatively small, nor has the adoption of a system of rigid scrutiny been at all detrimental to the numerical strength of the equine section of the exhibition, while its influence upon the quality of the competing animals has been decidedly good. No one has alleged that any hardship is inflicted upon exhibitors under the present arrangements; those horses which are selected by the judges are sent to a part of the show yard appropriated to the purpose, and those of them which are passed sound are returned for final adjudication upon their merits, and there is at least a guarantee that all the best-looking horses in the yard will pass the ordeal out of which they will come with their characters damaged or their reputations improved according to circumstances.

It is difficult to understand the motives which prompted the Council at their meeting on November 4th to abrogate rules which had been found to work so well, and to substitute a system of examination which will either throw the entire responsibility on the judges, or place the veterinary inspector in the awkward position of having to determine whether an animal is sound or unsound upon a very cursory and insufficient examination. According to the terms of the motion which was agrecd to at the meeting, horses exhibited at the forthcoming show at Manchester are not to be subjected to inspection, unless the judges think the examination to be required in reference to a particular animal, or a special point which may strike them during their own observation; the veterinary surgeon is to accompany them; and if while comparing the points of conformation it happens to occur to them that a horse has narrow feet or strong hocks or dull eyes, it may be inferred that the professional man's opinion

on these selected subjects will be asked; anything like a complete examination is, of course, out of the question, there can be no reason why one apparently sound horse should be examined more than another, and, therefore, if the new plan amounts to anything at all, it means that the judges are to be satisfied with an animal's seeming soundness, and to ask no question for conscience sake, unless there is strong ground for suspicion. It means, further, free admittance for what a horseman will call "good-looking screws;" and, ultimately, if the system is continued, which is scarcely likely, it means conversion of the show-yard into a repository on a large scale in which unsound horses may be made to display their accomplishments without fear of detection. It is possible that an ephemeral success will attend this unwise concession; it is certain that the ultimate result will be a return to the former unsatisfactory state of affairs, out of which the society has emerged, not without putting forth of strenuous efforts all the beneficial effects of which will be by this last movement entirely annulled.

Extracts from British and Foreign Journals.

THE SPANISH CATTLE FEVER IN AMERICA.

To the Hon. Horace Capron,

Commissioner of Agriculture, Washington.

After a careful consideration of all the facts in the case, I offer for your consideration the following:

Symptoms while living.—First. Fever, dead appearance of the hair, and a slight swelling between the inferior maxillary bones, accompanied, in most cases, with a dull look of the eyes.

Second. A hacking cough, drooping of the head and ears, dragging, reeling walk, breathing hurried, and in odour resembling the first stages of gangrene in man.

In milch-cows a sudden failure of the milk; the animal shows distress, frequently lying down, and almost always rising immediately and walking about. In most cases the bowels are found constipated, but are normal; others scour; in nearly all the urine is bloody.

To a close observer it will now be seen that the animal is

fast passing into the third stage. From the first, all will be struck with the sudden failure of flesh.

Third. The breathing is more hurried, panting; rising with great difficulty; breath very offensive; nose resting on the ground, a yellow mucus constantly running from the nose. If the animal can rise at all, it gets up first with its hind parts, and showing evident signs of paralysis of the whole body, with almost constant jerking of the tendons and reaching of the head and neck. At this point death soon comes to the poor sufferer, some dying in spasms, some are delirious.

Post-mortem.—In three I found the right lung diseased, but not sufficient to cause death. I may as well state here that the lungs are not the seat of the disease. The slight cough is caused by the free flow of mucus in the air-passages, being caused by a suspension of vital power. The air-passages and lungs of all are found covered with this yellow mucus. In some the kidneys are found enlarged; in all they are very black. The covering does not seem to have undergone any organic change, but the pulp is congested, acid, and very tender. Here, too, you find effusion; the cavity being full of bloody urine. More marked cases of disease are found in the spleen; in all cases it is found enlarged, pied, and very tender. A very characteristic change is found in the bile, it is converted into a black, thick, granulated mass, that will hardly run, and the portion of liver in which the sack adheres is gangrenous.

The bladder does not show any change in texture, but contains a large amount of bloody urine, generally very offensive to the smell. In some cases the bladder is enormously distended, the bladder and contents of one weighing nine pounds.

In some the heart and its covering show evident signs of a diseased condition of the blood, to wit, the pericardium and heart being spotted by blood extravasations. In a few cases the same have been found under the skin. I will here remark, before I proceed any further, that sufficient evidence is here found to prove conclusively that if it is not a blood poison from the first, the vitality of the blood is soon destroyed in part.

In all cases I found the liver congested, tender, and the pulp black. In some it is normal in size. The spinal cord, as far as examined, in colour is normal, but too soft; in some places the covering shows congestion, and here, too, is found the same yellow effusion. In one the thyroid gland was found enlarged, but from what cause could not be told.

In the second stomach evident traces of a high grade of

inflammation is found, probably from some local poison, as the manifolds in nearly all are found mortified.

In a few cases I have seen drops of blood standing on the animal before death, and reliable men tell me of the same.

The nostrils, fauces, and respiratory passages are found covered with this yellow mucus, or serum. It is also found deposited in the areolar tissue, and in a few cases large quantities were found in the cavity of the body. Nor is this strange when we take into consideration the congested condition of the liver and yellow appearance of the fluid.

The above are the anatomical conditions of the parts so far as I have been able to go. Not having time to investigate all, I here offer you a few facts in regard to the Texas cattle:

First. Are they diseased?

They are; at least some of them, and this can be proved by good men. I deprecate the necessity of having to differ with high authority. But when proof looks you in the face as plainly as it has in this it should not be passed by or covered up. Go to the farmers, and all who have seen these cattle, and they will tell you that the Texas cattle, when sick, had the same symptoms as our sick cattle had. Ask the men that had them in Chicago what was the matter, and they will tell you that they had been hurt on the cars. Who ever heard before of sick steers by shipment only 230 miles by rail and there were between two and three hundred died.

One man at Tolono told me "he had skinned 170 himself," and that "part of them were injured so as to cause death, but their vital organs were healthy." Also, that part had died of disease, and the same organs in the Texas cattle were found diseased as in our native cattle that had died of what we call Spanish fever. One Texas steer was so badly diseased as to cause marked attention, and his spleen was found to be three feet long and fifteen inches wide. If it should become necessary, I can, at any time, bring forward the affidavits of good men in proof of the above statement.

This disease is not like the rinderpest of Europe, nor is it like the pleuro-pneumonia of the Eastern States. Any careful observer can readily detect the difference in the symptoms. It is to be regretted that some of our agricultural papers have been duped into the error of calling them the same disease.

So far, the facts point to the Texas cattle being diseased, and it is probably confined to localities in the south. That part of them were diseased is proved by *post-mortem* examination.

It is a singular fact that the diseased cattle will eat dry food to the last. I saw one in particular that took water and

corn, chewed her cud, and licked herself a few hours before death, and this is not an uncommon thing.

I am sorry to be compelled to differ so widely with Professor Gamgee. As to his theory of eating certain kinds of plants in the south, not injurious to them, and retained until they arrive here, when it is thrown off in the excrement and proves poisonous to our cattle, it is not probable. If it were true, the meat of the Texas cattle would be poisonous to man.

Any plant containing sufficient poison to render the *urine* or *fæces* poisonous to other cattle, three to twelve weeks after eating it, would poison the cattle that eat it.

If these cattle leave Texas in March or April, feed on dry feed on the way, and arrive here in July or August, they will hardly have the same food in them that they ate in Texas.

It is now proved that the native cattle will take the disease from the Texas cattle when separated by a fence. This being the case, how can it be the droppings from the Texas cattle? These native cattle have not been out of their pasture since the Texas cattle came, nor for some time before.

The professor says :—"Native cattle will not give it to other native cattle." How does he know this? His first visit to Tolono was on the 1st of August, and the second visit to Tolono and this place on August 5th, and his report was made on the 7th, two days after his last visit. The first case of fever was on the 27th of July, being eleven days to test the reality of our native cattle giving the disease to others. He hints at characteristic signs of blood disease, but will not as yet, own it.

May not a solution of this desperate malady be found in some one of the parasite tribe, developed under certain conditions, and killing both Texas and native cattle, when circumstances favour its development?

The above is worthy of consideration.

We have the trichina in the hog, and the proof that the hog will fatten with this parasite in it, while if man partakes of the meat infested, it is sure death. It would seem that under some peculiar law of development they generate in man faster than in hogs; so it may be with the Texas cattle disease, and if it should prove to be true this changes could be accounted for.

The above is submitted for consideration, feeling thankful if I can only be the means of causing investigation to be made, whereby the cause and cure of this awful malady may be found out and made public. Respectfully,

Sodorus, Champaign County, Illinois; *August* 4, 1868. A. Catron.

—*Mark Lane Express*, Nov. 2, 1868.

THE PHARMACY ACT OF 1868.

This Act, which received the Royal assent on the last day of last session of Parliament (July 31st), establishes new and important regulations respecting the sale of poisons, and the practice of pharmacy. Its operation is confined to Great Britain, Ireland being specially exempted; and most of its provisions take effect from the 1st of January, 1869. There appears to have been some misunderstanding as to the extent to which it came into operation immediately on its passing; and discrepant statements having been published relating to this point, we have endeavoured to obtain opinions and information that shall enable us to explain, if not to clear up, any doubts that may be entertained on the subject.

There are two principal objects which appear to have been contemplated in framing the Act, namely—

1. To restrict the sale and dispensing of poisons to men who are qualified to deal in such dangerous articles.

2. To cause certain prescribed regulations, relating to the keeping, selling, and dispensing of poisons, to be observed by those who are legally authorised to deal in them.

The term "poison" is defined in the Act by reference to a schedule containing a list of the most important and dangerous poisonous substances; which list is divided into two parts, as follows:

Part I.

Arsenic and its preparations.
Prussic acid.
Cyanides of potassium and all metallic cyanides.
Strychnine, and all poisonous vegetable alkaloids and their salts.
Aconite and its preparations.
Emetic tartar.
Corrosive sublimate.
Cantharides.
Savin and its oil.
Ergot of rye and its preparations.

Part II.

Oxalic acid.
Chloroform.
Belladonna and its preparations.
Essential oil of almonds, unless deprived of its prussic acid.
Opium, and all preparations of opium or of poppies.

With reference to the first of the objects contemplated in the Act, it is provided that all those who at any time before the passing of the Act have been engaged in business on their own account, as chemists and druggists, in dispensing medicine from the prescriptions of duly qualified medical practitioners, and assistants and associates of the Pharmaceutical Society who have been registered under the Pharmacy Act of 1852, may be registered under this Act as chemists and druggists; and these, together with pharmaceutical chemists, and those who in future, after passing the prescribed examinations of the Pharmaceutical Society, may be added to the registers, will be authorised to sell and dispense poisons.

The 16th clause provides that nothing contained in the Act shall extend to, or interfere with, the business of any legally qualified apothecary, or of any member of the Royal College of Veterinary Surgeons in Great Britain, as far as relates to the power of retailing and dispensing poisons; nor shall extend to the making and dealing in patent medicines, nor to the power of wholesale dealers to supply poisons in the ordinary course of wholesale dealing.

The provisions of the Act relating to the legal authority to sell and dispense poisons will come into operation on the 1st of January, 1869, on and after which day any person other than a duly registered chemist and druggist, or a pharmaceutical chemist, or a legally qualified apothecary, or a member of the Royal College of Veterinary Surgeons of Great Britain, who shall retail or dispense poisons, will be subject, on summary conviction, to a fine of £5. The same penalty also applies to any person who shall take, use, or exhibit the name or title of chemist and druggist, or chemist or druggist, not being a duly registered pharmaceutical chemist or chemist and druggist; or who shall take, use, or exhibit the name or title of pharmaceutical chemist, or pharmaceutist, or pharmacist, not being a pharmaceutical chemist.

It thus appears that the Act, if strictly interpreted, prohibits the retailing and dispensing of poisons by medical practitioners in open shops if they be not legally qualified apothecaries; and it is obvious that the restriction applies even to the supplying of medicines by a medical man to his patients, if a specific charge be made for them. There are many general practitioners who, without a licence from the Apothecaries' Company, have been in the habit of supplying medicines to their patients, and hitherto there has been no law to prohibit them from doing so. There is also the class of licentiates of the College of Physicians, who have received from the College authority to dispense medicines to their own

patients. These men may be deprived of the power of conducting their practice as heretofore, and they will naturally feel this to be a hardship. In Scotland the case is even stronger, for there are no apothecaries there, the general practitioner being a surgeon who supplies his own medicines. A meeting has already been held in Edinburgh on this subject, and a strong protest expressed against the oppressiveness of this part of the Act, which it is quite obvious must either remain a dead letter or be speedily amended.

With reference to the second of the principal objects contemplated in the Act, some difference of opinion, to which we have already alluded, exists, as to whether the prescribed regulations relating to the keeping, dispensing, and selling of poisons came into force immediately after the passing of the Act, or whether they were intended to take effect with those parts relating to the other objects we have referred to, on the 1st January next. The latter opinion has been generally entertained, and we have before us a paper that has been circulated by the Pharmaceutical Society which recognises this view of the subject. It is founded upon a statement in the 15th clause, that "from and after the 31st of December, 1868, any person who shall fail to conform with any regulation as to the keeping or selling of poisons, made in pursuance of this Act," shall be subject to a penalty of £5, &c. Good legal authorities, however, say that this relates to regulations that may hereafter be made by the Pharmaceutical Society with the concurrence of the Privy Council; while the 17th clause, in which the existing regulations are referred to, places no such limitation to the operation of the law, but says "it shall be unlawful," &c. We therefore incline to the opinion that this part of the Act is now in force, as stated by Mr. Flowers, the police magistrate, at Bow Street.

The regulations required to be adopted in selling by retail any poisons depend upon whether they be contained in the first or second part of the schedule. If they be in the second part of the schedule, it is only required, in selling them, that they be distinctly labelled with the name of the article and the word "poison," and with the name and address of the seller of the poison. If they be in the first part of the schedule, in addition to the foregoing regulation, it is required that the purchaser shall either be known to the seller, or that he shall be introduced by some person who is known to the seller, and that the seller shall make or cause to be made an entry, in a book to be kept for that purpose, of the date of the sale, the name and address of the purchaser, the name and quantity of the article sold, and the purpose for which it

is stated by the purchaser it is required, to which entry the signatures of the purchaser and of the person (if any) who introduced him shall be affixed. Any infringement of these regulations subjects the seller to a penalty of five pounds for a first offence, and to ten pounds for a second or any subsequent offence. But these provisions of the Act do not apply to wholesale dealings, excepting as regards the labeling of the articles; nor do "any of the provisions of this section apply to any medicine supplied by a legally qualified apothecary to his patient, nor apply to any article when forming part of the ingredients of any medicine dispensed by a person registered under this Act, provided such medicine be labeled in the manner aforesaid with the name and address of the seller, and the ingredients thereof be entered, with the name of the person to whom it is sold or delivered, in a book to be kept by the seller for that purpose; and nothing in this Act contained shall repeal or affect any of the provisions of an Act of the session holden in the fourteenth and fifteenth years in the reign of her present Majesty, intituled 'An Act to Regulate the Sale of Arsenic.'"

In addition to the foregoing principal objects of the measure provision is made for effecting some subsidiary objects.

The 15th clause imposes a penalty of £5 upon any person who, after the 31st December, 1868, "shall compound any medicines of the British Pharmacopœia except according to the formularies of the said Pharmacopœia."

The 24th clause makes the provisions of the 'Act for Preventing the Adulteration of Articles of Food and Drink' to extend to all articles usually taken or sold as medicines, "and every adulteration of any such article shall be deemed an admixture injurious to health; and any person registered under this Act who sells any such article adulterated shall, unless the contrary be proved, be deemed to have knowledge of such adulteration."

The powers vested by the Pharmacy Act of 1852 in one of Her Majesty's principal Secretaries of State are by this Act transferred to and vested in the Privy Council; and the Council of the Pharmaceutical Society may, with the sanction of the Privy Council, add any article or articles to those specified in the schedule of poisons, and may frame regulations for the keeping, dispensing, and selling of poisons, which will have the same authority as those specified in the Act.

Lastly, it is provided by the 23rd clause that "persons registered under the Medical Act shall not be, or continue to be, registered under this Act;" and by the 16th clause it is provided "that registration under this Act shall not entitle

any person so registered to practise medicine or surgery, or any branch of medicine or surgery."

THE CATTLE PLAGUE IN NORFOLK.

(*Continued from* p. 780.)

Norfolk, with an area of 1,354,301 acres, with 92,673 head of cattle, had only 6674 attacked, being a per centage on the estimated stock in that county of 6·876.

Cambridgeshire, with an area of 525,182, with 31,731 head of cattle, had 7875 attacked, being a per centage in the estimated stock of 21·226.

Whilst *Cheshire*, with an area of 707,078 acres, with only 93,044 head of cattle, or very few more than in Norfolk, had 67,703 attacked, being a per centage on the estimated stock in that county of 52·286.

In the county of Cheshire the Orders of Council and the law were generally disregarded, and for some weeks after the passing of the act for the appointment of local authorities, &c. (I know, being on cattle plague business in the county), that it was not put in force, 32,730 beasts were allowed to die, and to these circumstances, aided by the nearness of the occupations, and the prejudice in favour of treatment, must be attributed the immense and ruinous nature of the losses in that county.

Surely no other examples can be needed of the insane practices of treating and endeavouring to preserve infected animals than these facts. And beyond all doubt the course of action that in future must be enforced, should this pest again break out in the kingdom, is to destroy at once the infected oxen and all that have been in contact with them or within the sphere of its baneful influence.

We have already seen that it was twice in 1865 stamped out in Aberdeen, and we know that in the same year in Belgium it was exterminated with a total loss of no more than 459 animals, at an expense to the government for veterinary and other aid of less than £4000 sterling.

In France in the same year, two outbreaks occurred, which were quickly stamped out by the government and its veterinary officers, with the loss in the first outbreak of 43, and in the second of 34 animals. It has been said here that the French Government was despotic and arbitrary, and what could be effected there could not be done here: but it is to be earnestly hoped that if another outbreak should occur in

England, as is not unlikely, and probably at no distant period, a government will be in existence in this country, unlike the late one, strong and determined enough to arrest its oward career, which the last one so signally and so shamefully neglected to do, to the great loss of the agricultural and general public.

It is further worthy of remark, that during that period of the cattle plague in Norfolk, when the movements of cattle were restricted by licenses, and close inspection maintained, that the lung disease was held in abeyance, and the mouth and foot disease, except at the outbreak of the pest, quite disappeared, but very soon after these checks to the propagation of the disease were removed, our old enemies reappeared. I regret to state that these disorders, especially pleuro-pneumonia, are now prevailing and spreading in this and the adjoining counties.

In proof of this, I may refer to the subjoined tabular statement, which I have collected from the books of the Norfolk Farmers' Cattle Insurance and Investment Company, which have been kindly placed at my disposal by the manager, C. R. Gilman, Esq., of this city. This company has been in existence twenty years, and has insured stock of the value of more than £2,000,000 sterling, and has awarded during this period upwards of £80,000 in compensation for losses among live stock; its experience, therefore, must be valuable and reliable, which shows that previous to the outbreak of cattle plague, the losses from pleuro-pneumonia were periodically very severe. As soon as the *restrictive measures* were placed upon the movements of cattle, and *fairs* and *markets* prohibited, this hitherto incurable and most destructive disease almost disappeared; and now that the free movement of beasts is again permitted, pleuro-pneumonia is once more asserting its malignant supremacy:

In 1858	the losses from pleuro-pneumonia upon the mortality from all causes of the whole number of neat stock insured in this year were	63½ per cent.
„ 1859	they were	45 „
„ 1860	„	47½ „
„ 1861	„	41¼ „
„ 1862	„	46½ „
„ 1863	„	35 „
„ 1864	„	35 „
„ 1865	„	26 „
„ 1866 *	„	1 „
„ 1867	„	8 „
„ 1868	up to Aug. 17, when these figures were extracted	30 „

* The year when restrictions and licenses were in force.

[Pleuro-pneumonia having an incubative period of from fourteen to forty days is consequently slower in its rise and progress than cattle plague, and therefore does not directly excite so much fear when it breaks out in a herd of cattle, and is not nearly so infectious; but practically its effect upon the stock of this country has had a powerful influence in making animal food dearer than many are inclined to believe, but who would soon understand if they would consult such authorities as are in existence, explanatory of its ravages since its introduction in 1842.]

Legislation has been urged on a little way in the right direction, as the Act of last session is calculated to control pleuro-pneumonia in a slight degree, by inflicting a penalty on persons exposing animals so affected in the markets of the kingdom. Next session I hope it will take a step further, and prevent such animals from being moved from place to place on the public thoroughfares until all fear of infection has passed away; this would tend, in the opinion of those best acquainted with the subject, to give it a severe check, and consequently would be the means of cheapening animal food in this country more effectually than any other course that could be adopted (foreign importation not excepted). The growing desire to encourage and foster free trade by the importation of foreign animals has, perhaps, its advantages, but certainly has its evils: for we are surely indebted to the foreigner for the introduction of diseases unknown for a century or more in England, of which smallpox in sheep, introduced first in 1847 and several times since, and cattle plague in 1865 furnishes us with too true and too costly exemplifications, to say nothing of pleuro-pneumonia and mouth and foot disease, which some consider to be of doubtful origin, but which the majority of those acquainted with the subject consider imported diseases, and with a greater show of truth, as they made their first *appearance* in England contemporaneously or nearly so with cattle importation into this country, and they have for the last quarter of a century done, I believe, more to make animal food dear than the importations have done to cheapen it. Free trade in animals to a great extent has hitherto been, I agree with the hon. member for East Norfolk, "free trade in disease."

Before concluding this brief and necessarily curtailed sketch of the outbreak and statistics of the progress, decline, and extermination of cattle plague in Norfolk, it will be expected perhaps that some slight mention should be made of an analogous disease affecting sheep, especially as some few losses have occurred in Norfolk alleged to be of the

nature of cattle-plague, and which at the time were the subject of much controversy and some angry feeling. I shall merely remark that about the 17th of August, 1865, this disease was said to have broken out at Blakeney, and on or about the 1st September at Crown Point. According to the Government reports, which take no further notice of the disease after the 10th November, 1866, seeing I suppose by this time there was no great necessity to do so, it appears that out of 596,683 sheep in the county of Norfolk only fifteen flocks had been affected with a disease at all traceable to bovine origin, and of which only 2393 died or were killed in consequence of its believed identity. Between 1200 and 1800 of these *died* from one flock at *Crown Point*, leaving very few deaths indeed to be accounted for in the *remaining fourteen*. It is worthy of note that a series of carefully conducted experiments were instituted at Crown Point by the medical committe appointed by the Norfolk Cattle Plague Association, to the furtherance of which the well-known liberality of the proprietor so largely conduced, were attended with a very doubtful result, at least so it struck me, inasmuch as 30 healthy sheep, comprising 20 lambs and 10 shearlings, were closely associated in a fold there, contiguous to the park where so many had died and were dying from October 10th to November 21, 1865, and during this period only four of the imported healthy lambs died in all, *one* of which was declared not to be affected with the disease analogous to cattle plague, and the ten shearlings *lived*, and were killed for the meat market at the time the fold was broken up on the 21st of November, in a perfect state of health, although five of them had been allowed to roam at pleasure in the park in contact with the diseased lambs, and on the pastures where this great mortality had occurred. The opinion of many eminent flockmasters, as well as that of Mr. Woods, of Merton, in this county, so celebrated for his knowledge of sheep and their breeding, was that the dryness of the season and food, the overstocking of the pastures, and general mismanagement, were more the causes of death than the special disease above referred to.

It will be found by the Government returns on the subject, that the sheep enumerated in Great Britain on the 5th May, 1866, were 22,048,281, and that the total number of farms, sheds, or other places in which disease had appeared among sheep was 104; that the total number of sheep slaughtered healthy to prevent the spread of the disease was 419; that the number attacked from the commencement of the disease was 6826; that the number killed was 1092; that the number which died was 4640; that the number

which recovered was 1031; and that unaccounted for was 63.

These figures and facts relating to the disease of sheep in Norfolk, and in Great Britain, I imagine will speak for themselves, they require no comment from me.

In conclusion, I regret to announce that I learn from the London newspaper reports of the last week (which have yet been uncontradicted), that 1290 foreign sheep have been brought by the ships Waterloo, from Rotterdam, and the City of Norwich, from Tonning, in such a diseased state that they were all destroyed, as they were found suffering from *variola ovina* (smallpox), and that so recently as on Monday last, the 17th August, 2400 more were condemned at Brunswick Wharf, Blackwall, and ordered to be slaughtered, making a total of 6090 sheep destroyed within a few days, and showing an excess of deaths of 162 sheep, in little more than a week, over the aggregate number lost during the two years and three months that cattle plague existed in England. Moreover, from the same source I obtain the information that between 3000 and 4000 sheep arrive weekly in London from Harwich under very suspicious circumstances. No doubt the foreign dealers do with their stock, when they get an opportunity, precisely what the London cow-keepers did with their cows in the time of cattle plague—send the suspected, if not diseased animals to market, and the metropolitan one seems now to be equally as accessible to the foreign as to the English dealer; for this we have to thank the opposition to the Foreign Market Bill of the last session, by the opponents of the present Government, who will see, perhaps, when it is too late, the folly of the course they took. We are, however, not without hope that a judicious measure will be carried in the first session of the new Parliament with regard to a market for imported animals, which will provide a remedy for the evil.

In the course of the discussion that followed the reading of this and other papers,

Dr. Eade said he was very desirous that the subject of Mr. Smith's paper, which had also been alluded to by Mr. Read, should not be passed by without some discussion, for he felt that though it might at the first glance appear to be unattractive or uninteresting to such a mixed audience as was there present, yet that it had an interest and importance to all far beyond its immediate relation to agriculture. He felt he had some right to speak on this subject, as he had been largely concerned in the preparation of the report of the medical sub-committee of the Norfolk Cattle Plague

Association, and had seen much of the disease during the time it had so extensively prevailed in this district. He thought it was a matter of congratulation that Norfolk had been the first to point out that the disease was intrinsically one of the class of eruptive fevers, and also that a Norfolk man, their valued member, Mr. Read, was one of those who had from the first most strongly urged upon the authorities the adoption of the remedy which alone was in the end found to be of any value, namely, the "stamping out" the disease. In watching the progress of the cattle plague epidemic, the three things which most struck the committee, were—1. Its fatality, some 70 or 80 per cent. of the animals attacked hopelessly dying. 2. Its intense contagiousness, nearly every ruminant—whether ox, sheep, goat, or deer—exposed to the infection, inevitably becoming infected by it. And 3. The hopelessness of all methods of treatment. The disease appeared to be most nearly allied in its characters to the well-known scarlet fever, and as had been foretold by Dr. Farr, the wave of the cattle plague disease had passed over the land in much the same way as that of an epidemic of scarlet fever was known to do. Its affinity to scarlet fever, and its belonging to the same class of disease, made its investigation at once of deep importance to the whole community, for as knowledge once gained was always branching out in new and unexpected directions, so there was not a fact or an item of real knowledge connected with the cattle plague, which, by its bearing upon scarlatinal disease, might not be the means of saving the life of some valued member of the family of any one there present.

Analysis of Continental Journals.

By W. Ernes, M.R.C.V.S., London.

PHYSIOLOGY.—RESEARCHES ON THE MIASMA PRODUCED BY THE HUMAN BODY IN A STATE OF HEALTH.

By Docteur J. Lemaire (from the *Recueil Vétérinaire*, Feb., 1868).

The author proved, by experiments made on the confined air in barracks and casemates, that it contained a great number of microphytes and microzoids in the course of their development. The great cleanliness of the rooms and the

recent plastering of the walls did not allow the supposition that these small creatures were produced by the dust or dirt of walls or furniture. The composition of the vapour of the water collected in the atmosphere in the vicinity of the barracks was so different as forcibly to lead to the opinion that these animalcules were produced by the soldiers.

My object (the author says) is now to show in what part of the body they are found, how they are developed, detached, and dispersed in the atmosphere.

The researches which I am about to describe were made on men and women from thirty to seventy years of age, and in perfect health.

Region of the body where they exist.—In the course of these experiments I propose to show that the organism of which, physiologically speaking, is in a state of good health, not only does not produce the microphytes or the microzoids, but destroys them, and that it is on the outsides of the organs that they are found. They abound on the skin and n the mouth.

Skin.—It is well known that persons who perspire much, have their skin rapidly covered with a crust or layer of substances known as crass or dross. It is also well known that men and women who neglect the care of their toilet, or otherwise are not particular about the cleanliness of their bodies, exhale an unpleasant odour from certain parts as, for instance, the ano-perineal, the axillary, the inguino-scrotal, the feet, &c. If, after having well cleansed those parts with soap and water, perspiration is provoked, and six hours after this perspiration is examined with the microscope, there will be found, besides the epithelium and the fatty matter, spherico-ovoido-cylindrical bodies, similar to those which I have shown to exist in the confined air of barracks and casemates. If in summer the parts above mentioned are neglected for forty-eight hours, and perspiration is provoked, so as to enable one to collect some of the sweat, there will be found in it, except in that of the axillaries, the *Bacterium termo et punctum* and small vibrions. If these parts are not clean for a fortnight the dirt which has accumulated in the vicinity of the genital organs and between the toes exhales a fetid odour and reddens litmus paper. If, under this condition, perspiration is provoked and the product of it is examined microscopically the following bodies are found in it :—Epithelium, globules of fatty matter, some crystals, diaphanous bodies, mentioned above, in great numbers; myriads of bacteria, *Bacterium termo, Bacterium catenula,* formed with two, three, and even four segments; *Bacterium punctum,*

vibrions of different dimensions, small *Spirillum voluntans*,and ovoid monades, some of which were notched. The dirt collected under the nails of the great toe, diluted with a little distilled water, was found to contain bacteria and small vibrions. The matter collecting in the axillaries for a fortnight—containing a great number of ovoïd spores, but only a few of the *Bacterium termo*—reddened litmus paper. The dirt taken from the anterior part of the chest and the epigastric, abdominal, the lumbar and dorsal regions, strongly reddened litmus paper, and being diluted with some distilled water, a great number of diaphanous bodies of a spherico-ovoido-cylindrical shape were found, and also many round spores, presenting a central nucleus, which gave to them the appearance of a small coin of money. In the *cerumen* neither spores nor animalcules were found.

These experiments are not only interesting on account of their showing that there exists on the skin a great number of diaphanous bodies, but also microphytes and microzoids, which the author found in the condensed vapour collected in the barracks and casemates; but likewise in some regions of the human body, the variation of the species. The absence of the microzoids in the dirt collected on the skin of the trunk seems to explain the difference in the odour exhaled in those parts where the animalcules multiply. These results completely confirm those which I obtained from the ferments, and show that the order of the apparition of infusoria depends on the chemical composition of the different matter. This influence is so strong that I have been able to procure at will the microphyte where the microzoids were commonly developed, by merely adding or subtracting one or more chemical agents to the natural product. Thus, the existence of the microphyte without the existence of the microzoids, and reciprocally, appears to be in the different chemical compositions of the perspiration. I cannot too decidedly direct attention to the influence of chemical agents on those substances in which these small creatures are developed, because I believe that they play an important part in the history of transmittible diseases.

I will now examine how these little beings become developed on the skin. Physiologists generally admit that a man in good health and in a state of repose loses in twenty-four hours one litre of perspiration; he who walks or works will perspire from four to five litres in the same space of time, and even more if placed in a dry, hot atmosphere. Now, this perspiration contains, independent of salts, fatty and lactic acids, a notable quantity of albumoid coagulable matter. All

these bodies form in the skin a depôt called *crass,* which accumulates day by day, and is increased by the dust in the atmosphere and body-linen, this crass or filth is kept in a moist state by the imperceptible perspiration, and being in contact with atmospheric air of a regular temperature of 36 centigrades.

These conditions are very favorable to fermentation, and consequently to the development of microphytes and microzoids. If a man who is at work produces in the twenty-four hours from 4 to 5 litres of sweat, he could thus in a fortnight contain the residue of from 60 to 75 litres of sweat, and adding to this the dust of the air and body-linen, we may easily appreciate the number of infusoria which these 75 litres of liquid matter containing in it dissolved albumen, might produce. One need not, therefore, be surprised that myriads of microphytes and microzoids are developed. This is not all; the temperature of the confined air would greatly increase the number. Moreover, the great quantity of watery vapour exhaled in the respiration and from the skin soon saturates the atmosphere in a confined space; besides, the skin remains moist and often covered with sweat. All these conditions are, no doubt, favorable to the development of these small beings, not only on the skin, but also in the atmosphere, when the tenuity of their bodies enables them to maintain themselves. The miasms disengaged in the marshes of hot countries, where the temperature approaches that of the human body, have a more speedy and violent action than those of temperate climes.

I made experiments on the free air of Paris when the thermometer marked 35 and even 36 centigrades in the shade. Meat, albuminous water, and other alimentary matter, undergo rapid fermentation. Twelve hours sufficed for the development of bacteria and vibrions. It is, therefore, unquestionable that the temperature when high renders the reproductive faculty more vigorous, and the animacules more speedily attain the adult state; at a temperature of from 15° to 20° Centigrade it requires at least forty-eight hours to obtain the same results. Thus, an elevated temperature of the body can likewise accelerate their development, and render them more vigorous. Is it to this vigour that the redoubtable effects of the miasma of the marshes in hot countries are to be attributed?

I will reserve this question, but I use it to explain the presence of animalcules completely developed in six hours after the condensation of the watery vapour in the air collected in barracks and casemates. At the same time, it serves

to explain the reason why the condensed vapour of the air, taken from above the fortification, only produced animalcules forty-eight hours after; the temperature being only 16°, the reproductive bodies must have come from some other source. The microscope has long since proved that blood and milk, pus, and other organic fluids, and also the cretaceous matter which collects on the teeth, contain a considerable number of microzoids. The sweat, which is produced by the water from the plasma and the sudorific glands is in the same state when deposited on the surface of the body, and no longer protected by the laws of vitality, becomes subject to the common laws of fermentation. As no fermentation takes place, properly speaking, without the production of infusoria, this seems to me to have been the origin of those I found on the skin.

In those experiments, the results of which I communicated to the Academy, I have proved that the gas and vapour disengaged during alcoholic fermentation and putrefaction, disperse in the air a considerable quantity of germs and spores of the reproductive bodies of the microzoids, and even of some little beings completely developed. It is in this way that those which exist on the skin of man become dispersed in the atmosphere.

It is generally admitted, in France and in other countries at the present time, by a great number of medical men, that favus, plica, sycosis, and other diseases of the skin, are produced by the microphyte. These diseases, it is well known, are transmissible maladies. In bygone ages, as at the present time, it has been admitted by medical men that want of cleanliness was the great cause of these rebellious diseases.

We have already shown that dirt engenders the microphytes and the microzoids; but here I trespass on the ground of pathology, which I do not intend to enter yet. I will only recall to memory, because the facts have relation to each other, that at the Hospital St. Louis the existence of the spores of the *Achorion Schönleinii* were found in a limited atmosphere, where patients affected with favus had been located.

Mucous membranes.—Infusoria have been found in the mucus accumulated on these membranes. I collected from several persons in perfect health the mucus from the nose, mouth, pharynx, urethra, vagina, and the expectoration of the bronchial tubes, but found no infusoria in it. I have done more, I have kept the mucus so collected in small bottles, stoppered with emery exposed to the air; I have found that it resisted putrefaction for a much longer time than that col-

lected from the marshes. From these facts I am inclined to think that the infusoria found in the mucus owed their development to a pathological state of the fluids in the mouth.

I have said that it was stated that bacteria and vibrions were found in the cretaceous matter collected on the teeth. I may also add that persons with carious teeth, and irritated gums besides, present us with a considerable number of the *Spirillum volutans* and *Monades*, and there are few adults in perfect health who have not some carious or hollow teeth, or who have not between them some remnants of aliments or pultaceous matter; it is thus easy to understand that, by breathing through the mouth, they may fill the air with microzoids. This is soon demonstrated by making a person who usually neglects his teeth, breathe in a vessel filled with ice, the respiration becomes condensed; in it will be found, besides the reproductive elements of microzoids, likewise bacteria and vibrions. The two *Bacterium catenula* and the vibrions which I found in the vapour collected in the casemate, at the moment of condensation, no doubt, came from the mouths of the soldiers, who habitually take little or no care of their teeth. I will show presently that the vapour exhaled from the lungs contains no infusoria; they must, therefore, come in these cases from the mouth.

Products of the respiration.—It is generally admitted that the product of the respiration contains organic matter, to which great importance has been assigned in the history of miasma. To demonstrate their existence, the respiratory vapour has been condensed by cold; after which the liquid has been allowed to stand in a temperature of about 20° Centigrade; in the course of some days a substance has been found suspended in it exhaling an odour of putrefaction. The same experiments had been made on the air in the dissecting rooms of the hospital, and on that of the miasma of the marshes; and the same phenomena have been reproduced. These substances were analysed, and in all cases were found to contain nitrogen, but were not examined microscopically. I have shown that the substance, which is formed by the process of condensing animal matter in a state of putrefaction, and also on the marshes of Sologne, is composed of microphytes and microzoids. Finally, in that which is condensed in the open air, there is also a deposition, but not quite so abundant, which might likewise contain either microphytes and microzoids or microphytes only, in accordance with the locality.

In an experiment repeated in the presence of M. Chevreul

I ascertained this last fact. This substance in every case was caused by the development of the living beings. If one had reflected that, at the moment of the condensation, the liquid is clear and limpid, consequently contains no substance in suspension, at least visible to the naked eye; and that if it contained either albumenoid matter or fragments of tissue, both the one and the other, would be destroyed and reduced to their proper elements by putrefaction; it is, however, probable that one would have been able to recognise its true nature.

In the explanation given of the formation and its mode of action, this matter would at one and the same time play the part of ferment, become decomposed and developed, which is impossible. The demonstration which I have made seems to me to resolve this question. Independent of the facts I have reported, and which seem of the highest importance in the history of miasma, I have ascertained another, which is not less interesting, viz. that there is no deposit formed from the condensed vapours of the respiration, while the contrary has generally been admitted. In this experimentors have been led into error by the *modus operandi*. I have just stated that a depôt is formed composed of living beings from the vapours condensed in the open air, and that the product of the respiration passing through the mouth becomes impregnated with microzoids. The deposit observed in this case arises from the microphytes and the microzoids contained in the mouth and in the air. In taking certain precautions which I will point out, one can demonstrate, as I have done before M. Chevreul, not only that there is no deposit produced, but that neither microphytes nor microzoids are developed. This is how I have demonstrated it. I previously well cleaned out the mouth and throat with a solution containing two per cent. of tartaric acid (this acid kills the microzoids) after which all parts are well rinsed with clean water. I always operate in the morning while fasting, to avoid the emanation of aliments or drinks, &c. I then respire through the nose, and make the product of the respiration pass through a tube provided with small bowls, surrounded with ice, taking great care that no saliva gets into it; for this purpose I hold one end of the tube between my lips. Twenty minutes suffice to obtain in this manner several grammes of condensed vapour. This fluid at the time of its collection contains fragments of epithelium, some very small globules, and also some very small black grains; these latter seem to be composed of carbon. This fluid being put in a bottle, hermetically stoppered, was examined with the

microscope every two days in summer, during a whole month, but showed no signs of microphytes or microzoids, and the fluid remained perfectly limpid.

I repeated these experiments ten times over, always with the same results. I have, moreover, preserved some of the fluid for twelve months, and it remained as clear and limpid as on the first day. I have asked myself this question, whether the globules which are found in this fluid are not the elements of reproduction of infusoria which have not become developed in it for want of the proper aliment. To enlighten myself on this point I made two experiments, viz. to five grammes of the condensed fluid I added fifty centigrammes of albumen, from a newly laid egg; and at the same time I made another experiment to compare with it: five grammes of distilled water were added to fifty centigrammes of the same albumen. These compounds were put in two bottles containing six volumes of air to one of the fluid; these bottles were stoppered with emery, and were left in a temperature of from 22° to 25° Cent.; but I found no difference either in the number or the species of the animalcules developed in these two fluids nor in the time of their appearance. These experiments appear to demonstrate that the product from the lungs of individuals in good health contains neither microphytes nor microzoids.

I have now to treat of the most difficult point of this question, that is, to ascertain whether these small beings are the cause of typhus, typhoid fevers, or cholera, &c. I have already stated my opinion on this subject (in 1861), but science demands facts, and it is with facts that I will undertake the solution of this question, if the Academy will further favour me with its kind attention.

(*To be continued.*)

THE NATIONAL VETERINARY BENEVOLENT AND MUTUAL DEFENCE SOCIETY.

The third annual meeting of the above Society was held in the Queen's Hotel, Leeds, on Thursday the 22nd October, 1868. The following gentlemen were present :—Wm. Field, jun., President of the Royal College of Veterinary Surgeons, London ; Professor Williams, Principal of the Veterinary College, Edinburgh ; E. C. Dray, Leeds : Wm. Broughton, Veterinary Surgeon to his Royal Highness the Prince of Wales, Leeds ; J. Cuthbert, Leeds ; Thos. Greaves, Manchester ; P. Taylor, Manchester ; A. L. Gibson, Manchester ; Jas. Howell, Rochdale ; D. McTaggart, Halifax ; J. Bale, Otley ; Jas. Freeman, Hull ; Jos. Carter, Bradford ; P. Walker, Bradford ; Thos. Pratt, Masham ; J. Anderton, Skipton ; J. Schofield, Pontefract ; M. Naylor, Wakefield ; G. Smith, Darton ; W. Fearney, Leeds ; Geo. Morgan, Liverpool, etc., etc.

In the absence of the President, Mr. A. Lawson, Bolton, from indisposition, Mr. Dray was called to the chair.

The minutes of the last annual meeting having been read and confirmed, the Chairman called on Mr. Morgan, Hon. Secretary, to read the annual report, which was as follows :—

The Third Annual Report of the National Veterinary Benevolent and Mutual Defence Society.

Gentlemen,—In presenting to you the third annual report, I have to state, that in accordance with the resolutions passed at the last annual meeting, the Committee appointed to revise and consolidate the rules of this Society, after several meetings and a good deal of correspondence, agreed to a code of rules which they considered suitable to the Society ; 500 copies of these were printed and forwarded one to each member of the society.

I would here wish to draw the attention of the members present particularly to Rule 12, by which the date for payment of the annual subscription is fixed, and also the penalty attached to non-compliance with that rule ; members must blame themselves and not the officers of the Society if at any time they should be in the unfortunate position of requiring the aid of the Society and find themselves debarred by their own wilful negligence, as has been the case on more than one occasion during the past year. Not that any of the officers would refuse to assist any member out of a difficulty in their private capacity to the fullest extent, but when members do not conform to the rules, they feel bound to refuse any aid as officers of the Society.

When this Society was proposed, there were some that said we should only open the flood-gates of litigation, and collect money to fee lawyers ; now, in answer to this, I can congratulate the members on the important fact that with one single exception, and that only to a small amount, your funds have not been touched for law ex-

penses, and we have now completed the third year of our existence. Now some may say this shows that such a society is not necessary, but in order to show the fallacy of this idea, I would here mention that during the past year your officers have been applied to, either verbally or by letter, in no less than fifteen cases of threatened actions against veterinary surgeons. Some of the applicants were not members of the Society, but in each case we have given our best advice only in our private capacity, and happily in general with satisfactory results.

Your officers have thus become possessed of some valuable information as to the best mode of conducting those cases, and the general bearing of the law upon them—as, for instance, in the case of pricking horses in shoeing, the law assumes that negligence or carelessness has been the cause, because pricking and laming horses is not the ordinary result of shoeing; therefore it is not necessary for a plaintiff to prove that it was the result of negligence, but it is for the defendant to prove that on this particular occasion some special or exceptional circumstance existed which caused the nail to deviate from the usual course.

I shall now proceed to give you a short sketch of some of the cases which have occurred during the year, from which it will be seen that actions arise as frequently from other causes as from shoeing.

1st. Heap *v.* Brookes. This action was tried in the Manchester County Court, in January of the present year, before Mr. Ovens, to recover the sum of £24, the value of a cow belonging to plaintiff, and which died from milk fever in the month of July previous.

It was not contended that the treatment was improper, or that Mr. Brooke's assistant, who attended the case, was in any way incompetent, but that the cow was lost through the neglect of Mr. Brookes, who was confined to his bed and unable to attend, and his assistant had gone to another case, and thus two hours of valuable time were lost at the commencement of the case.

After a good deal of contradictory evidence as to the exact wording of the first message delivered, Mr. Haycock, V. S., gave evidence to the effect, that in his experience he rarely lost a case of milk fever when called on at the early stage; he had heard the evidence in this case, and the impression on his mind was that the cow could have been saved if the defendant had attended when first sent for.

Mr. Greaves, V. S., gave evidence for the defendant to the effect that in some cases the attack is so acute and so violent, that it runs its course in a few hours, and that no method of treatment is of any avail, even if the veterinary surgeon were in attendance at the outset. He had heard the evidence in this case, and the opinion he had formed was, that it was a most acute attack, that prostration supervened so rapidly that no mode of treatment could have prevented her from sinking, even if applied at the earliest moment.

The Judge, in summing up, said he fully entertained the same opinion, and gave a verdict for the defendant. Mr. P. Taylor, V. S., was also in court to give evidence for the defendant if required.

The next case is one in which a veterinary surgeon was sued for

damages sustained as the consequence of *unskilful advice.* The case was heard in the County Court, Liverpool, before Mr. Serjeant Wheeler. Ellison *v.* Ellis. The action was brought to recover a sum of £50 on three counts. First, because of the detention of a mare by the defendant, the estimated value of which was £14; secondly, on account of damage sustained through the defendant's unskilful advice; and, thirdly, for the keep of a horse. The case was tried by jury, and lasted seven hours. They gave a verdict for £31 on the second count, which with expenses amounted to rather a round sum.

The next case is that of a horseshoer, at Bolton. Eckersley *v.* Hindle. Heard before J. J. S. Green, Esq., County Court Judge, June 12th. This was an action to recover the sum of £15 15*s.* for damage done to a horse, the property of the plaintiff, by the servant of the defendant, who is a horseshoer in Bolton.

This case had been heard on the 8th of May, and a verdict was given for the plaintiff, for £13 10*s.*, but your President, thinking that a gross injustice had been done to the defendant, interested himself in the matter, and got a fresh trial granted. He, Mr. Greaves, and your Secretary attended on this occasion, and gave evidence for the defence, but, although the case lasted several hours, it was quite evident from the beginning that the Judge had made up his mind to confirm his former decision. Had this case been tried before a jury, there is little doubt the decision would have been different. There was one point in this case to which I would wish to draw your attention.

On the defendant stating in his evidence that when the horse was brought to have the shoe put on, he remarked to the man that brought him, that "the horse would be better in the stable with his foot in a poultice, than having a shoe put on for work." The judge said, "even this showed gross negligence on the part of defendant, in his putting a shoe on a foot unfit to carry a shoe, even when instructed by the owner to do so."

It is only a short time since that a veterinary surgeon was held liable for the value of a cow on account of his not following the course of treatment suggested by the owner. Such is the glorious uncertainty of law.

The next case was heard in the Sheriff's Court, Galashiels, on June 2nd, before Mr. Sheriff Milne,—Mark *v.* Murray,—and was an action to recover £6 4*s.* as damages and loss sustained from injury done to a valuable horse in shoeing. In this case an old act of the reign of James III, 1477, was cited as the basis of the claim, as well as common law. Evidence having been given for both parties, the Sheriff said he had no difficulty in coming to a decision. Pricking was an accidental circumstance which frequently occurs, and the plaintiff had failed to remove the shoe and apply early remedies, for which he had himself to blame. Verdict for defendant.

The next case was also a shoeing case, and was heard before Mr. J. K. Blair and a jury, in the County Court, Liverpool, 2nd July. Clyne *v.* Taylor. In this case the plaintiff sought to recover the

sum of £27 6*s*., damage sustained for loss of time. The defendant partly acknowledged his liability by offering to take the mare from plaintiff at the time she fell lame. It was also shown on the trial she was of very little value originally, and that she was as good then as when the injury was done.

Mr. Greaves, Mr. Proctor, Mr. Heeps, and your Secretary attended and gave evidence for the defendant; and a verdict was returned in his favour.

The next case was similar to the last, and was tried in the Court of Passage, Liverpool, before Mr. Pickering, Q.C., and a jury, on 17th July. Bowker *v*. Godfrey. In this case damages were claimed for the loss of time to one horse, and the total value of another that died from an alleged injury in shoeing. A verdict was given for the defendant. In this case I attended and gave evidence.

The next case—Fallows *v*. Carter—is also a shoeing case, heard before Mr. J. W. Harden, at the Northwich County Court. The action was for loss of work, damage to the horse, medical attendance, etc., for which the plaintiff claimed £31 10*s*. Mr. Darwill attended and gave evidence for the defendant, but unfortunately the verdict was for the plaintiff for £10.

I shall now give you a sketch of a rather curious case of threatened action against a veterinary surgeon, a member of this Society. He is also a livery-stable keeper, and some two years since a horse and gig were left at his stables, by a gentleman who went away and never looked near them again. He kept them for some six months, then advertised and sold them, paid himself, and handed the balance over to the solicitor and a sister of the owner, who had told him the owner had either left the country or got into an asylum. However, twelve months after the sale he turned up again, and demanded his property back, said he had never authorised any one to sell, and threatened the veterinary surgeon with an action. He applied to the Society through its officers, who, I believe, were quite willing to do what they could for him as private individuals, but as your officers they felt they had no power, as this member had requested the Treasurer to place his subscription to the Benevolent Fund; he had also a son in partnership with him who was not a member of the Society, and he thus became only entitled to the benefits of the Benevolent Fund. They, however, obtained certain information on the points at issue, which they considered would be sufficient to stop further proceedings. But it seems that that is not yet the case, for no later than the 7th of the present month another threat was made to obtain warrants to indict this member and three others for conspiring to defraud, and it is doubtful whether such may not be done. I may here state that this is not the case of a young practitioner, but a gentleman who has been in business for upwards of half a century, and who has been during that long period a credit to the profession.

The next case to which I would draw your attention is also the case of a member of this Society, who keeps livery stables in connection with his other business. Some three months ago he wrote

to your Treasurer, stating his case, which was this. On one occasion his stables were full, and in order to accommodate some horses, he put them in his shoeing forge; one of them got lamed, and as the owner expected him to make good the damage, he made application to the Society to assist him. The Treasurer sent the letter to me, as your Secretary, to reply to it. I replied that I did not consider it one of those cases to defend which the Society was established, as it was quite evident that he had done wrong in removing a horse from the stall and putting him in the forge, when he was paid for providing a stall, and that in my opinion it would be best to try and settle it with the owners.

We heard nothing more of this case till the other day, when a letter was received by the Treasurer stating that the member had paid £15 damage and kept the animal at his own cost for twelve weeks, and asking the Society to recompense him.

Now, gentlemen, I shall only trouble you with one more case, but before stating that I beg to say, that up to this point we have not spent a shilling of your money, but have travelled scores of miles, at considerable expense and loss of time, each man bearing his share from his own private purse, so anxious have we been to gain credit for economy, and thus secure your approbation by husbanding your resources, and by these means hastening on the day when the veterinary profession shall possess a Benevolent Fund for the support of the aged, the widows, and the orphans, worthy of a name, and the want of which at the present day I consider as one of the greatest blots on our escutcheon.

It may appear strange, gentlemen, but it is not the less true, that the first case in which your officers found it necessary to set the machinery of this Society in motion was at, I may say, the most distant point from its centre, viz. in Ireland, and I am proud to say that its mission was a successful one.

In the month of May last a young member of the profession, Mr. John Malcolm, of Enniscorthy, castrated a colt at a place called Ballycross, twenty-seven miles from his place of business; he heard nothing more of the colt for fourteen days, when he received a message that the colt was ill, and from the description given he concluded that it was a case of tetanus; but, as he had an appointment in an opposite direction some fifteen miles for that afternoon, he could not attend to him, but sent by messengers suitable medicine, with instructions to let him know on the following morning the state of the case, and he would attend to him then. However, he heard no more of him, till he received a letter from the owner, stating that the colt had died, and claiming compensation to the amount of £14. Mr. Malcolm replied, that he never held himself responsible for the success of any operation, and refused to pay the whole or any part of the money demanded: the consequence was that Mr. Rowe, the owner, through his solicitor, served him with a civil bill process for the amount, which Mr. Malcolm forwarded to your president, along with written statement of the particulars of the case, on which a meeting of your Council was

summoned to Bolton, there being present the president, treasurer, Mr. P. Taylor, Mr. Howell, and the secretary. Most of the other members of Council wrote, stating their inability to attend, but at the same time expressing their opinion that it was a case which should be defended. As it appeared to those present that they had not sufficient evidence to form a decided opinion on the matter, and the great distance preventing a personal interview with Mr. Malcolm, a series of queries was drawn up and forwarded to him, which he answered in a very straightforward and satisfactory manner, and also forwarded to the treasurer the £5 required by Rule X. Your Council then instructed your president and secretary to take the necessary steps for the defence of the action, and proceed to Ireland when the trial came on and act as they thought best for the interests of the Society and the profession at large. Feeling as they did that a great principle was at stake, they exerted themselves to obtain all the information possible; and with this view your president wrote the editors of the *Veterinarian*, requesting information as to similar cases. Amongst the replies received in answer to this was one which deserves particular notice, being from the hand of a lady, the worthy sister of the late Prof. Dick, thus adding another to the many obligations the profession is under to that honoured name, and which I myself and many others present have personally experienced and can never forget. The President also wrote to several veterinary surgeons in Ireland, who were ready and willing to come forward and give evidence if necessary.

As the trial was fixed for the 14th of the present month, we got there on the day previous, in order that we might have a conference with Messrs. Corcoran and Sinnott, the solicitors instructed for the defence, who received us and the suggestions we made as to the best mode of defence in the most kind and friendly manner imaginable.

The profession at large are also much indebted to Dr. Cranfield, and Dr. Goodisson, for their attendance for two days in Court, to give evidence if necessary as to the frequency of tetanus supervening on operations in the human subject. Their services were fortunately not required, yet not the less valuable.

On the first day of the Sessions, several of the plaintiff's witnesses did not appear, and the case might have been struck out of the list without a hearing; but, as a serious and damaging charge had been brought against a most respectable and deserving member of the profession, it was decreed to have it heard in Court, which was done on the following day.

Three witnesses were examined for the plaintiff, but neither of them showed that the least blame could be attached to Mr. Malcolm. So satisfied was the judge, H. West, Esq., Q.C., of this, that he said he would have stopped the case then had it not been that a very serious charge had been brought against a professional man's character, and he considered it his duty to give him an opportunity of publicly clearing himself of the imputation.

Mr. Malcolm was then called, and described the mode in which he performed the operation, and his usual custom in these cases, also the cause which prevented him from seeing the colt when sent for.

The Judge then said, it was useless calling any more witnesses in this case, as he was quite satisfied, from the plaintiff's own witnesses, that he had not the least claim on the veterinary surgeon.

The colt had been well and skilfully operated on, and he might have died by the visitation of God, even if he had not been castrated, and tetanus was an affection that often followed the most simple wounds. It was only a short time ago that a gentleman he knew was separating two game cocks that were fighting, when one of them struck him on the back of the hand, making a slight wound; and although treated by the best scientific skill that the country afforded, he was attacked by tetanus and died. He could not see any conceivable grounds on which the action was brought, and it should never have been brought; there was not the least imputation on Mr. Malcolm's character, and he should dismiss the case on the merits. He also allowed £4 costs for witnesses. Having now brought our proceedings for the by-past year up to the present time, we resign our trust. The treasurer will enlighten you as to the state of the finances.

Mr. P. Taylor then moved, "That the Report be received and adopted," which was seconded by Mr. Broughton, and carried unanimously.

Mr. Greaves then moved, "That the President be requested to convey to Dr. Cranfield and Dr. Goodison the best thanks of this meeting for their great kindness in attending to give evidence in Mr. Malcolm's case," which was seconded by Mr. Dray, and carried unanimously.

The Treasurer then read the following statement:

Treasurer's Report for 1866, 1867, *and* 1868.

The duties that I have to perform to-day in presenting to you the financial statement are very light indeed, and in a certain sense tolerably satisfactory.

I find the state and progress of our Society for the three years it has been in existence, to be as follows:—

	No. of Members.	Amount of Cash Received.			Expenses.			Balance in hand.		
		£	*s.*	*d.*	£	*s.*	*d.*	£	*s.*	*d.*
September, 1866 ...	43	24	3	0	10	3	0	14	0	0
September, 1867 ...	143	99	4	6	16	5	0	100	18	6
October, 1868	144	207	4	6	15	18	2	294	4	10
					Bank Interest.....			1	6	3
								295	11	1

It will thus be seen that the number of members increased 100 in the year ending September, 1867, and increased one in the year ending October, 1868.

It will also be seen that the funds in hand increased in the year ending September, 1867, £86 18*s.* 6*d.*, and in the year ending October, 1868, they increased £194 12*s.* 7*d.*

The number of members in arrears of payment in September, 1867, was 108. The number of members in arrears of payment in October, 1868, is 45.

The amount of funds in arrear in September, 1867, was £144 18*s.* The amount of funds in arrear in October, 1868, is £91 15*s.* 6*d.*

The amount of the fund in the Bank, in the three Trustees' names, for benevolent purposes, is £86 14*s.* 7*d.*, and for defence purposes, £222 8*s.* 5*d.*

The special thanks of this Society are due to the Lancashire Veterinary Medical Association, for the generous vote of £50 from their funds.

The funds have been well husbanded, the only expenses incurred and charged to the Society being printing, postage, stationery, and sundry incidental expenses; no travelling expenses have been charged, with the exception of the deputation to Ireland, which consisted of the President and the Honorary Secretary. That deputation went forth on their errand of mercy with every good feeling, and accompanied with every good wish; our eyes followed them, and we watched them with an anxious feeling akin to that interest evoked when watching a lifeboat on its benignant errand; we see it breasting the waves with a persistency that calls forth the highest admiration, we see it as it nears the vessel in distress, our strong glasses enable us, whilst in a state of breathless anxiety, to see the half-drowned and exhausted men taken out of the rigging and placed in this little boat; we see it leave the sinking vessel and approach the land; as the boat touches the shore we see the crew with their oars pointed into the sand, and just at the precise moment as the furious wave comes dashing upon them the crew join their willing and powerful aid to the swelling wave, and the boat leaps upon the dry land like a thing of life. At that instant the pent-up feelings can be restrained no longer, and a lusty British cheer rends the air, "They are saved, they are saved!" The simile holds good in our case. At the thrilling moment our worthy Secretary throws up his hat in triumph. A message is wafted underneath the Irish Channel, a flash of lightning proclaims to us the glad tidings, "We've won, we've won."

Gentlemen, whatever labour, time, or money, I may have expended from time to time, or whatever distances I may have travelled with a view to advance the cause of this Society, believe me, I felt repaid a thousand times over by the unspeakable satisfaction I experienced at that moment, and I should think that every member of the profession, whether a member of this Society or not, will feel his heart stirred within him when he sees how the crew of our little craft

have acquitted themselves on this their first trial; our boat has not been swamped, nor even sprung a leak; our little craft has proved herself to be thoroughly seaworthy,—it answers to the helm admirably, our captain has her well under command. Yes, our lifeboat and its gallant little crew are ready and willing for service again to-morrow if an emergency arise. Yet there are those who say this lifeboat is not required. Their selfishness admits of no sympathy for others; the utmost excitement compatible with their indolent temperament is manifested in their reply, "Oh, wait until the necessity arises, and then we will think about it." This class of men I am at a loss how to characterize. But science has recently discovered that a process of reproduction is constantly going on in the animal kingdom, to which it has given the name of spontaneous generation, by which creatures are born we know not how, and come from we know not where: they are evolved from the atmosphere, or even from the vacuum of an empty bottle. So with men who do not want to join our Society, or be of any service to their professional brethren.

Mr. P. Taylor then moved the adoption of the financial statement, which was seconded by *Mr. Freeman*, and carried unanimously.

It was then moved by *Mr. Dray*, "That the President be requested to write to each of those members who have not yet paid their subscriptions, requesting that such sums be at once paid."

The motion was seconded by *Mr. Howell*, and carried unanimously.

A vote of thanks was then passed to the officers for their services during the past year.

The meeting then proceeded to elect officers for the ensuing year as follows:—

President.—Mr. Peter Taylor, Manchester.
Vice-President.—Mr. E. C. Dray, Leeds.
Treasurer.—Mr. Thos. Greaves, Manchester.
Hon. Secretary.—Mr. Geo. Morgan, Liverpool.

Council.—Messrs. Wm. Field, jun., London; Prof. Williams, Edinburgh; John Lawson, Manchester; Gilbert Heyes, Liverpool; John Cuthbert, Leeds; Wm. Broughton, Leeds; Jas. Howell, Rochdale; Wm. Whittle, Worsley; Alex. L. Gibson, Manchester; Jos. Carter, Bradford; D. Mc Taggart, Halifax; Jas. Freeman, Hull.

A unanimous vote of thanks was then passed to Mr. Dray, for his able services in the chair; after which the company adjourned to dinner, Mr. Dray acting as chairman, Mr. Nicholson in the vice-chair.

After the usual loyal and patriotic toasts, Mr. Dray proposed that of the Royal College of Veterinary Surgeons, and in doing so said, "It is with mingled feelings of pleasure and regret that I propose this toast, pleasure at having at my right hand Mr. Field, the President of that body, whose ability for so important an office is fully proved by his election for a second time, and is a compliment of which any one might be proud. To many of the other members

of Council great credit is due, for they have travelled long distances, at great expense and inconvenience, to be present at the Council meetings, and they richly deserve our best thanks. The regret I have is at the very little good that has resulted from their deliberations. I am fully aware they have many difficulties to contend with, but still there is little or no progress made. The charter, in in its present state, is nearly a dead letter; empiricism reigns rampant, and we are almost helpless to check it. Why does not the veterinary profession receive the same protection as the medical? I am much afraid there does not exist that unanimity amongst the members so necessary for our advancement, and we have not that example set us from head-quarters which ought to be our guide, for I have been well informed that there was at one time, if not at present, a great want of harmony at our College in Camden Town, which has driven away some of the most valuable teachers from that school. I am also sorry to observe that discord and personalities have lately crept in at the meetings of the Council, —a thing much to be deprecated, and which, I am persuaded, will have a very injurious effect in retarding our elevation,—and I do trust there will be no repetition of such unbecoming conduct, but that kindness and urbanity will pervade their future meetings, and that their best energies will be put forth for the interests of the whole body of the profession. I can confidently assert that there is a strong disposition on the part of the provincial members to support the Council in their efforts. Do not then disappoint us; prove that our confidence is not misplaced, let there be more united and progressive action, and then the next time I have the honour of proposing this toast I shall be able to congratulate the profession on the good results that have been attained, and the prospect of still further achievements. Gentlemen, I give you the Royal College of Veterinary Surgeons and the President, Mr. Field.

Mr. Field, in reply, said there was, no doubt, a great deal of truth in what Mr. Dray had said, but it must be borne in mind that the hands of the Council were very much tied. In the first place, they had no funds, except those derived from examination fees, and if they were to adopt a severer examination they would reduce their annual income; besides, in the present state of the profession, it was questionable whether the Council would be supported by the Schools, if they attempted to establish severer examination tests. Neither was it the fault of the Council that they had not an Act for the protection of the profession, similar to that granted to the medical profession. They had done what they could to obtain an Act to make it a punishable offence for any one to call himself a veterinary surgeon who had not got a diploma; their efforts had been frustrated; but he might state that it was their intention to try again, and he had little doubt, by the aid of the united profession, they would succeed.

Mr. Naylor then proposed the "Veterinary Schools." In the remarks he made, complained of the little advance that had been made in veterinary education, especially in England: the progress

they made in this country was not equal to that made in Scotland; but one great thing to be attended to was, preparing young men with a suitable education before they went to College, and he thought all students ought to pass an Oxford or Cambridge examination, or else submit to a preliminary examination similar to that of medical students.

He was also of opinion that Government ought to aid the schools with funds, the same as they did in foreign countries: they would then, as a profession, be able to obtain that protection from Government to which they were so well entitled.

Professor Williams (Edinburgh) acknowledged the toast. He said he was glad that the veterinary schools were self-supporting, and would much rather that they should remain so than depend upon the State for support. In Edinburgh as thorough a veterinary education was given as it was possible within the short time students were compelled to attend. Medicine, surgery, anatomy, physiology, and chemistry were amongst the branches taught; and he might say that in Dr. Young, who had studied not only in Edinburgh and Glasgow, but in Germany and France, they had one of the best physiological lecturers of the day. They had lately established a summer course, which, although it had not been largely attended, would be continued; and an inducement had been offered to students to go through an extended curriculum by Miss Dick (sister of the late Professor Dick), who had established two bursaries of £30 per annum for three years. (Applause.) He reminded the meeting that there could not be preliminary examinations unless the subject were taken up by the Council of the Royal College; but whether this was obtained or not, he was confident such was the desire to elevate their profession, that it would not be long before its honours would be aspired to by men of the highest respectability.

Mr. Broughton then proposed, "The Veterinary Examiners," which was responded to by *Mr. Field*.

Mr. Howell then gave "The Veterinary Profession," which was responded to by *Mr. P. Taylor*, in his usual eloquent and impressive manner.

The Chairman then proposed, "The National Veterinary Benevolent and Mutual Defence Society;" and in doing so spoke with great earnestness and at considerable length on the necessity which existed for a benevolent fund, and how far we were behind the age in having no such fund from which we might dispense relief, however small, to those members of our profession who through sickness or other causes over which they had no control, were in reduced circumstances. Of the Defence portion of the Society they already possessed evidence, not only of the requirements of such a Society, but of its usefulness.

Mr. Gibson replied to the toast, and in doing so suggested that a special appeal should be made to the members of the profession for funds to place the Benevolent branch of the Society in a position of usefulness.

Prof. Williams, in proposing the next toast, that of the Provincial Veterinary Medical Associations, said he did so with peculiar pleasure, in the first place, because he had personally a good deal to do with their formation in that part of the country, and still felt a great interest in their success; and secondly, because he found coupled with the toast the name of Mr. Thomas Greaves, a man who had made the subject of veterinary medical associations peculiarly his own, and to whom the profession was very much indebted for the very great interest he had taken in their success. These associations had done a great amount of good, and would continue to do a great amount of good, if members would only attend their meetings, and avail themselves of their advantages. He had only to point to the formation of this Society as an evidence that they had done good, for if it had not been for the Provincial Medical Associations, this one would not have succeeded. He was glad to see them extending over the country, and had no doubt that wherever they were established their influence would be felt for good.

Mr. Greaves, in responding said, I have found it has previously been the case in every district in which veterinary medical associations have been established, that shyness, misunderstandings and bitter heart-burnings, have existed amongst some of the members of the profession, and even between whole families for a longer or shorter duration; and in every instance baneful effects have attended such conditions. The object of these associations is to cause this spirit to subside and substitute for it a friendly, cheerful, frank, gentlemanly feeling and conduct. I have all along been strongly advising that members should not stand cavilling and quibbling about this or that assumed unprofessional conduct, and saying, I will not sit at the same table, or meet at the association such and such a one, unless he apologises to me for such and such an act done to me at such and such a time, for then commences an endless process of fending and proving. Now, Gentlemen, I look upon it that this is a fallacious way of proceeding; I believe in it to be as Professor Simonds and Gamgee said of the cattle plague, "That the greatest danger of perpetuating the cattle plague, was in attempting to cure it." This is exactly what I say about these grievances, a few of which may be real, very many imaginary. I advise in all such cases the same treatment as those wise professors recommended to Government with a view to cure the cattle plague, viz., "stamp it out." Stamp it out; let it be buried; set your foot upon it; let bygones be bygones, both with individuals and also with bodies of men in our profession; and commence afresh with these associations. Whenever you meet each other, whether it be in the hunting field, in the horse-fair, in the cattle market, in the lane, in the street, or in the sick-box, meet each other with an open hand, an open countenance and an open heart; be frank and candid with each other; treat each other as gentlemen, and, depend upon it, this example will teach the public to treat you as gentlemen; let

us defend each other's honour behind each other's back, as we would do before each other's face; whenever and wherever we may happen to meet, let us meet each other cheerfully, and at once enter into some pleasing and profitable topic of discourse; relate some interesting case; show to what you attributed its recovery, &c., &c. Such meetings as these will always prove profitable and will bear reflection; if this spirit and practice became general, we should soon feel it to be a much greater pleasure to meet a veterinary surgeon than to meet any other man—not as used to be the case in the days before the establishment of these veterinary medical associations, to shun one another, and always depreciate each other behind each other's back. You are aware, Gentlemen, that two other associations have been formed, viz., The Edinburgh Veterinary Medical Association, and The Eastern Counties Veterinary Medical Association. The president of the last named delivered a most excellent and exhaustive address the other day. Now, if all these associations be conducted in a right spirit, and supported in a proper manner, I have not the slightest hesitation in saying, that they will become organs of the greatest usefulness and power in the veterinary profession, in hastening forward every great and good movement. They can contribute a great help to the colleges, also to the council of the Royal College of Veterinary Surgeons, by showing those bodies what are the wishes of the body of the profession upon the various questions of the day. They can materially assist those bodies in effecting an unanimity amongst themselves. They can materially assist those bodies in carrying out the initiatory examination. They can assist them in successfully adopting the apprenticeship system for the veterinary student; and last, though not least, they can be of the utmost service to the council and the parliamentary committee of that council, in obtaining an Act of Parliament whereby the profession shall become raised to a status in which every true lover of his profession yearns to see it occupying.

GEORGE MORGAN, *Hon. Sec.*

NORTH OF ENGLAND VETERINARY MEDICAL ASSOCIATION.

THE twentieth quarterly meeting of this association was held at Grey's Adelphi Hotel, Newcastle-on-Tyne, on Friday, October 16th, 1868. The members present were—Messrs. D. Dudgeon, S. Scott, W. Marshall, R. Brydon, R. Hall, D. McGregor, W. S. Moore, J. Meikle, C. Stephenson, J. Goften, and the Honorary Secretary. In the absence of the President (Mr. C. Hunting), Mr. Dudgeon took the chair.

The minutes of the preceding meeting were read and confirmed. Mr. W. Marshall then read his paper on some of the abnormal

consequences of castration, which was listened to with attention, and followed by a discussion in which many members took part. It was proposed by Mr. Stephenson, and seconded by Mr. McGregor, that a vote of thanks be given to Mr. Marshall for his valuable paper, which was carried by acclamation. The election of office-bearers was then proceeded with. Mr. Dudgeon proposed, and Mr. Moore seconded, that Mr. T. Pews be elected President for the ensuing year.—Carried unanimously. It was proposed by Mr. McGregor, and seconded by Mr. Stephenson, that Mr. Brydon be elected a Vice - President.—Carried. Proposed by Mr. Dudgeon, and seconded by Mr. Gofton, that Mr. Hall be elected a Vice-President.—Carried. Mr. Brydon proposed, and Mr. McGregor seconded, that Mr. Dudgeon be retained as Treasurer.—Carried. Proposed by Mr. Dudgeon, that Mr. Meikle be elected Secretary; seconded by Mr. Moore, and carried. Proposed by Mr. Brydon, and seconded by Mr. Dudgeon, that Messrs. H. E. Wilkinson, C. Stephenson, H. Hunter, D. McGregor, J. Goften and Mr. S. Moore be Councilmen for the ensuing year.—Carried. A vote of thanks to the Chairman having been given, the meeting separated.

JOHN MEIKLE, *Hon. Sec.*

NORTH OF SCOTLAND VETERINARY MEDICAL ASSOCIATION.

A SPECIAL Meeting of the Members of the North of Scotland Veterinary Medical Association was held in the Mechanics' Hall Buildings, Aberdeen, on Saturday the 24th October, Mr. Dewar, the President, in the chair. The following members were present:—Messrs. Hart, Elton; Stewart, Rothiemay; Cassie, New Machar; Masson, Kintore; Bird, Bervie; Diack, Old Meldrum; Barron, Cullerlie; Barron Neils, Turriff; Millis, Inverurie; Duguid, Udny; Keith, Strichen; M'Donald, Lonmad; Thompson, Aberdeen; Taylor, Aberdeen; Grant, Tyvir; Cameron, Kincaurrir; Robbie, Banchory Lernau; Tait, Elgin; Robertson, Stonehaven; Bell, Fraserburgh; Berry, Inverurie; and Robertson, Dudwick.

The minutes of the previous meeting having been read and approved of, the president called upon Mr. Stewart to open the discussion on 'Puerperal Fever.' Mr. Stewart went into the *cause*, *nature*, and *treatment* of the disease at considerable length. Most of the members present took part in the discussion, the majority of them seemed to consider bloodletting in *milk fever* opposite to good practice, but strongly advocated the use of mild laxatives, stimulants, and good nursing. The essayist seemed to have more success than any of the other members appeared to have. Out of twenty-nine cases he had under his treatment the present year, he only had two which terminated fatally. His essay having

appeared in full in the *Veterinarian* for September, it is needless to give a rehearsal of his mode of treatment.

The next business that came before the meeting was the subject of a Veterinary Charter for Scotland. The President enumerated the advantages and disadvantages which would accrue from having a Scotch charter ; the majority of the members were inclined to consider that the advantages would more than counterbalance the disadvantages, in consequence of which Mr. Cassie, New Machar, moved "That the North of Scotland Veterinary Medical Association is desirous that a Veterinary Charter for Scotland should be obtained, providing it were formed on a proper footing, and the veterinary profession in Scotland sufficiently represented." Mr. Keith of Strichen seconded.

Mr. Thompson, Aberdeen, proposed as amendment, "That this Society considers the present agitation uncalled-for, and moves that the subject be dropped until a future meeting." Mr. Stewart, Rothiemay, seconded, and was supported by Messrs. Robertson, Stonehaven ; Robbie, Banchory, Ternau ; M'Donald, Lonmay ; Duguid, Udny, and Robertson, Dudwick.

Mr. Cassie's motion was carried by a considerable majority.

A vote of thanks to the President for his conduct in the chair terminated the business of the meeting.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

MONTHLY MEETING OF COUNCIL, NOVEMBER 4TH, 1868.

H.R.H. the Prince of Wales, K.G., President, in the chair.

In the course of the meeting several important subjects were discussed relating to the Exhibition Show of 1869 at Manchester, Agricultural Education and the Editorship of the Journal. The Council, adopting the report of the Committee, elected as Joint Editor and Secretary Mr. Jenkins, who is at present discharging the duties of Assistant Secretary, Curator, and Librarian of the Geological Society of London : he is also the Editor of the Quarterly Journal of that Society, and Sub-Editor of the "Quarterly Journal of Science."

Referring to the subject of the annual exhibition of stock, Mr. Jacob Wilson called attention to the present system of veterinary inspection in the show-yard, and moved that at the Manchester show in 1869 no veterinary inspection of horses be required, except when considered necessary by the judges, who shall be accompanied by the veterinary inspectors. This resolution was agreed to.

SMITHFIELD CLUB.

A MEETING of the Smithfield Club was held at the Agricultural Hall, Nov. 4th, 1868; the Earl of Hardwicke, President, in the chair.

The minutes of the last Council were read and confirmed.

Authority was given for the necessary steps to be taken for obtaining the licence for holding the show as last year.

On the motion of Lord Walsingham, seconded by Lord Tredegar, it was resolved—

"That the Council expresses its opinion that all cattle exhibited at the Smithfield Show should, under proper regulations, be allowed to be removed into the country at the close of the show."

The following Committee were appointed as a deputation to wait on the Lord President of the Privy Council to urge the same, viz., the Stewards, Honorary-Secretary, Mr. Clayden, and Mr. C. S. Read, M.P.; and the same Committee was authorised to make the necessary arrangements as to disinfecting cattle-conveyances, &c.

On Tuesday, Nov. 16th, the deputation had an interview with the Lord President. The concession which was sought was granted, with the proviso that no animals which have been in the metropolis for more than seven days previously shall be admitted to the show.

OBITUARY.

WE have to record the death of Mr. R. Walters, M.R.C.V.S., Birmingham, after a protracted illness. His diploma bears date January 29th, 1840.

Also of Arthur Henry Statham, Derby. Diploma dated April 29th, 1858; and of George Brown, Pendleton. Diploma dated December 22nd, 1858.

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